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BRITISH GUIANA.

VOL. XIX. JANUARY, 1926. No. 1

A MESSAGE TO FARMERS.

The two articles "Food Plants of British Guiana" and "The Preparation and Cooking of Locally Grown Vegetable Foodstuffs" which appeared in Vol. X, Nos. 3 and 4 of this Journal, have been revised and republished in this number by special request. At the time these articles were written (1917) the Colony was suffering not only from the high cost of foodstuffs but also from an actual shortage of certain articles of food. This state of affairs should have acted as an incentive to our farmers to extend the cultivation of fruit, vegetables, grains and pulses, at least to the extent of making the Colony self supporting; instead of which we find that to-day, in so far as production is concerned, we are in the same position as that we held before the War. The average annual value of such imports as fresh and dried vegetables including onions and garlic, fresh fruits, beans, peas and lentils is in excess of half a million dollars, a large proportion of these imports being from our neighbours in the British West India Islands and Dutch Guiana. The statement by the writers of the original article still holds good that "These if planted in sufficient quantity under suitable conditions and properly tended would not only render this colony independent of any external supply of vegetable food but would leave a large surplus for export to other countries."

In October 1919 the Government started the vegetable products factory in order to induce farmers to increase the area under maize and to establish a better market for their rice and pulses by converting them into flour. The products from all these were excellent, but in spite of the considerable amount of energy and moneys devoted to the working of the factory, it had to be closed down after three years' trial. owing to the impossibility of obtaining sufficient supplies of corn or of pulses to keep the mill in working for more than a few months in the year, and also on account of the high prices demanded by farmers for their crops.

In recent years Government has spent considerable sums of money on improving the drainage of the coastlands of the colony, and farmers are now assured that their crops will not be destroyed by floods as occasionally happened in the past. This should certainly give them encouragement to extend their cultivations as far as their finances will permit. It is possible that lack of capital has been the main factor in preventing our farmers from attempting to raise crops which they have had no previous experience in cultivating. On this account we strongly advocate the proposed establishment of an Agricultural Loan Bank, and should this proposal meet with the approval of Government, it is for the farmer to show by increased production that he is worthy on this occasion of the confidence placed in him.

AGRICULTURAL SHOWS.

By A. A. Abraham, Horticultural Superintendent.

VICTORIA-BELFIELD AGRICULTURAL SHOW.

The Victoria-Belfield Agricultural Show was held on the 6th October, 1925. The show was disappointing from the paucity of its exhibits and led one to conclude that it was confined to Victoria and Belfield alone, with a small competition from Buxton. It seems never to be taken into consideration by villagers and farmers that shows are organized and encouraged by prizes as an incentive towards the extension of agriculture both in regards to field production and the preparation of the products.

This was the tenth show held at Victoria, and naturally one looks forward to these shows as a criterion to progress both in respect to quantity and quality. From an agricultural point of view, there was certainly a lack of enthusiasm towards the success of the show. As a matter of fact, exhibits were not handed in until the morning of the show.

Exhibits of the minor industries of the Colony such as Rice, Coffee and Cacao were very few. Of Sugar-cane there were only two exhibits. The display of Coffee and Cacao from the West Bank, Demerara, which was always a feature at the East Coast Shows, was entirely absent.

This Show was held under the Distinguished Patronage of E. M. Walcott Esq., F.R. who made some encouraging remarks in reference to the efforts of this Department to instruct, stimulate and render valuable assistance in the several districts of the Colony; and the speaker urged that the Department must have the co-operation of the farmers in its endeavours in order to show substantial results.

Class 'A'. There was one exhibit of fruit plants, and this did not even merit second prize.

Class 'B'. *Fruit section:* This was the poorest represented section. The only exhibit which deserved any special mention was that of Coconuts, which were placed in this class. The specimens were of good commercial standard, in view of which, extra prizes were given.

Class 'C'. *Vegetables.* The exhibits in this class on the whole were satisfactory from the point of view of quality. Pumpkins, Yams, Cassava, Tannias and Eddoes made up the major portion of this class. The Plantain exhibit was very poor, also Tomatoes.

Class 'D'. *Economic Products.* It is safe to report that only one-half of the entries which were displayed last year, was staged this year. The standard of the Guava jelly and local jams has certainly improved since the farmers competed in 1924 for extra prizes offered by the local committee of the Wembley Exhibition.

Class 'E'. *Poultry.* The exhibits were of the ordinary or creole ~~shame~~. Very little care was taken as regards preparing the birds for competition.

Closs 'F'. *Cattle.* A fair type of cattle was shown, and better care taken with the animals in presenting them for competition.

Class 'G'. *Needle and Fancy Work.* Even in this class there was an absence of keenness. The embroidery and fancy work shown were adjudged commendable. No plain needle work was exhibited.

WEST BANK FARMERS' JOINT AGRICULTURAL AND INDUSTRIAL SHOW.

The West Bank Farmer's Second Joint Agricultural and Industrial show was held on the 27th October, 1925.

The Show was held at Stanleytown Village this year and it was anticipated that by the change from Bagotville it would increase the number of exhibits and

thereby the importance of the Show. This object was not achieved, as the Show did not come up to the standard of the one held at Bagotville on the 28th October last year.

This Second Joint Show, however, was of a decidedly better standard than that of Victoria-Belfield held on the 6th of the same month, both in respect to keenness and the number of exhibits.

Class 'B,' *Fruits*:—In this section there were 194 exhibits. Sweet Oranges were shown on a very large scale, there being 37 exhibits; and deserve special mention as regards quality. Shaddocks and Grape-Fruit were also good. There were no exhibits of the fruits mentioned on the Prize List, and others which were entered for competition, such as mangoes, Granadillas, Mammee Apple, and Guavas were exceedingly poor. Probably this was due to the trees not being in bearing at the time, coupled with the dry weather being experienced.

Class 'C,' *Vegetables*:—This was a very disappointing section as regards the quality and number of exhibits. This class was the poorest section of the Show, and would lead to the conclusion that probably the present long spell of dry weather greatly retarded the progress of growing vegetable crops.

Class 'D,' *Economic Products*:—This section was well represented and was the redeeming feature of the Show. Creole Coffee, for which the Canals are noted, was well displayed and of very good quality. Cacao Pods, Beans, and prepared Chocolate ranked next in importance and these exhibits were also good. There was more competition in regards to padi and rice at this Show than that held at Victoria. The Starches and Meals were plentiful in number and well prepared. The excellent quality of the coconut oil exhibits attracted much attention and received favourable comment from the commercial gentlemen who were present.

Class 'F.' *Cattle*:—This section was small, but an exhibit of fair type of cattle was shown.

Class 'G.' *Forest Products*:—There was only one Palm Oil which was awarded 2nd prize.

The Show was opened by Mr. A. P. G. Austin, Manager of the Colonial Bank.

MAHAICONY AGRICULTURAL, INDUSTRIAL AND LIVE STOCK SHOW.

The second Agricultural, Industrial and Live Stock Show was held at Mahaicony on the 25th November 1925.

This Show was not up to the standard of the one held last year both in regards to the number of exhibits and in its educational value. Compared with Shows of the other districts, it was, however, of a higher standard than either the Show held at Victoria on the 15th October, or the one held at Stanleytown on the 27th of the same month.

The primary object of the holding of Agricultural Shows, which should be borne in mind by Agricultural Associations and farmers, is, that in addition to the exhibition of farm crops and their by-products, they should lead, by competition, to increased production of better agricultural produce.

Judging from the number of exhibts shown in the *Vegetable Section* it is evident that very little vegetables is, at present, being produced on the East Coast. This, however, may be partly due to former floodings complained of by the farmers, and to being hampered by the effects of the present continuous dry weather. There were only six exhibits of Plantains and the specimens were very poor. The most satisfactory exhibits in this section were Sweet and Bitter Cassava, Eddoes, Tannias, Buck Yams, and three exhibits of Sweet Potatoes. There was only one exhibit of Black Eye peas, which was awarded a special prize with the hope that it would be an incentive to extend the cultivation of this variety of legume. The sample was excellent. There were ten entries for the "Best Basket of Mixed Vegetables." In this lot there was

keen competition. This was, however, no criterion that the vegetables were grown by the exhibitors; as a collection of these can be made by purchase. There were only two exhibits of Pumpkins. There were no exhibits of the following:—Tomatoes, Breadfruit, Onions, and Giant Plantains.

The Fruit Section, too, was not very encouraging. No doubt, the present dry weather is somewhat responsible for the dried up and shrivelled appearance of the Citrus fruits. Sapodillas, which were a noted feature both as regards size and sweetness at last year's Show, were exceedingly poor this year. There were two exhibits of Golden Apples, and two of Limes. The Golden Apples were fair, but the Limes poor. No exhibit of Avocado Pears was shown this year. There were nine exhibits of Sweet Oranges, and those which were awarded prizes were the produce of farms in the Canals, West Bank Demerara River. There were only three exhibits of coconuts this year, but these however, were very good specimens. The exhibits of Padi, five in number, were very fair, and showed that some progress is being made to produce a good product. There was a total of 145 exhibits in this section.

Class 'C' *Economic Section:* This section can, somewhat, be always relied on in making a show. The makers of Starches, Meals, Guava Jelly, and Colonial Pickles are becoming experts in preparing these commodities. It is a striking feature that these persons are residents of Victoria, Belfield, Golden Grove and Nabaclis. Although there were no exhibits of Guavas there were nine of Guava Jelly and six of stewed Guavas. Much improvement has been made in respect to the quality of the jelly and the method of exhibiting.

The Canals coffee-growers took a very keen interest in the coffee competition. There were six exhibits of Creole Coffee and five of Liberian. The samples were very good and carefully prepared. The exhibits of White and Brown Rice were of very good quality.

Class 'D.' *Live Stock.* This was a very poor section, being much below last year's standard. No special in-

terest was shown and practically no competition. The exhibits were as follows, 1 Milch Cow, 1 Heifer, 1 Bull and 2 working Steers.

This Show was opened by Mr. J. Wood Davis.

REPORT ON EAST COAST CANE-FARMING COMPETITION.

BOTANIC GARDENS,
GEORGETOWN,
16TH NOVEMBER, 1925.

SIR,

We have the honour to submit the following report on the results of the judging of the East Coast Farmers' Competition Plots at Buxton-Friendship, Victoria, Nabaclis—Golden Grove and at Beterverwagting—Triumph, which was held on the 10th, 11th, 12th and 13th instant.

Buxton—Friendship. The plots entered at this section consisted chiefly of plantains, with some cassava. There were four (4) entries at Buxton and four (4) at Friendship. The plantains have been growing on the beds for a number of years and do not appear to have received any careful cultivation for some time. They have been allowed to sucker profusely without control, thereby affecting the proper development of the produce. The soil, too, is worn out from repeated cropping of root-crops in former years. This is apparent by the stunted growth of many of the plantains

seen. Apparently no special efforts have been made to improve or maintain the fertility of the soil by mulching and the cultivation of legumes etc. Under the circumstances we are unable to recommend any of the plots in this division for prizes.

Victoria—Nabaclis and Golden Grove. Of the eight entries submitted for judging in this section, two were withdrawn on the day of inspection. The farmers whose plots were judged have paid careful attention to the cultivation of their crops, and have put into practice agricultural advice given them. Their crops are unfortunately suffering severely from the continuous dry weather.

The following table gives the results of the judging at this section, the awards being made under the following headings.

Condition of cultivation and tillage	50	marks
Condition of drainage	50	,,
	100	

Name.	Village.	Crops.	General Cul'v'ion	Drainage.	Total.	Prizes. $ c.
Prince Cuffy ...	Victoria	Cassava	45	40	85	15.00
Hamlet Collins ...	,,	Mixed	50	30	80	12.00
Thos. Cuffy ...	,,	,,	40	35	75	10.00
Robt. Benn ...	,,	Cassava	30	35	65	5.00
G. Cockfield ...	Nabaclis	Mixed	45	45	90	18.00
A. C. Baptiste ...	,,	,,	40	40	80	12.00

Beterverwagting—Triumph. We regret to report that farming at this section has declined. The entries last year were six (6), this year only five (5) plots were entered, and of these, two were struck out on account of their neglected appearance. The results of the judging at this division are as follows :—

Kind of Wood.	Oven-dry Weight in Grams.		Loss in Weight per cent.	Remarks.
	Before test.	After test.		
Eastern Hemlock ..	7.85	3.17	59.6	Friable when dry.
Mountain Hemlock ...	8.61	3.08	64.2	...
Western Hemlock ..	7.94	3.08	61.2	...
Englemann Spruce ...	7.23	2.27	68.6	...
Stika Spruce	4.33	1.63	62.4	...
Red Spruce	7.07	2.30	67.5	...
White Spruce ...	5.62	1.70	69.8	...
Grand Fir	7.10	2.12	70.1	...
Noble Fir	7.53	2.25	70.1	...
European Larch ...	7.88	4.50	42.9	Well rotted.
Western Yellow Pine ...	7.60	3.35	55.9	Friable when dry.
Lodgepole Pine ...	6.93	2.47	64.4	...
Longleaf Pine ...	11.42	5.59	51.1	...
Shortleaf Pine ...	12.25	9.72	20.7	Seriously rotted in the summer wood.
Table Mountain Pine ...	10.22	6.17	39.6	Friable when dry.
Norway Pine ..	8.00	2.45	69.4	...
White Pine	6.71	6.12	8.8	Slightly rotted.
Sugar Pine	6.06	2.55	57.9	Friable when dry.
California Juniper ...	10.66	10.31	3.3	Slightly affected
Bigtree	7.07	4.59	35.1	Seriously rotted.
Greenheart	17.16	17.12	...	Not appreciably affected

The percentage loss in weight of Greenheart was below five per cent. and is not given as they may lie within the experimental error. Douglas Fir, Pitch Pine and several other species became too wet during the experiment for a fair test to be made.

With these figures before one it is depressing to think of the number of uses to which American lumber is put in Georgetown; in perference to Greenheart timber for which British Guiana is the world's only source of supply. It seems unreasonable that people should have their wood imported from afar when vastly superior timber is to be found almost at their doors.

It is hoped that Mr. Humphrey will soon publish his tests on American timbers and give to the timber world the added knowledge consequent on his most thorough and pains-taking researches.

One may confidently expect, however, that these researches will uphold, if not materially strengthen, the claims of **GREENHEART** to be durable above all other timbers.

AGRICULTURAL RESEARCH IN RELATION TO THE COMMUNITY.*

It is a common reproach that agriculturists have not made the same use of science as have those engaged in the other great industries—that farming is still a rule of thumb process carried out by methods which have their origin in the dark backward and abyss of time. In some respects this is indeed true. One has only to read Cato or Columella to realize that the Italian peasant of to-day is working and living in very much the same way as his Roman forebears, and even the more highly organised farming of Great Britain or Denmark or Holland is carrying on many of the essential operations of cultivation on lines that were laid down by the first great civilizers—the Romans. It is easy in fact to trace modern agriculture to a Roman ancestry; in Britain, for example, by the trans-plantation from the fifteenth century onwards of the traditions and practices that persisted through the dark ages in the Low Countries.

None the less progress has taken place and scientific development is going on. Under medieval systems of agriculture the yield from England's land was of the order of six to eight bushels of wheat to the acre........ Latterly we have seen the yield creeping up a little through the introduction of heavier cropping wheats—the products of scientific research.

Great are the achievements and still greater the possibilities of agricultural research, but we must recognize that there are limitations to the effect of science upon agriculture which do not hold for the other industries. In the first place, in agriculture we are dealing

* An address delivered by Sir A. D. Hall before the Graduate School of the U.S Department of Agriculture, January 26, 1925.

with a living organism and the amount of control that we have obtained over plant or animal, over that stubborn essence we call life, is far less than we can exercise over inanimate nature, over iron or cement, or even the ether or the atom.... We see no way of growing three or four crops a year under temperate climate conditions. The organisms we are dealing with will go through their cycle and you can not hurry them. When you start hustling you find you let in secondary troubles of all sorts.

These limitations lie in the nature of things, and though on looking back we can count up the immense advances that agriculture owes to the application of knowledge we must not hope for sudden development or revolutionary changes such as have been seen in flying or wireless telegraphy. In fact for the time being I am bound to say that agriculture is actually suffering from the rapid developments and scientific achievements that have distinguished other industries. I say this advisedly and most solemnly. Agriculture is the fundamental industry, because we must all be fed, and yet you cannot point to any part of the world where agricultural wealth is being turned out and find the producers in a flourishing condition.

The only hope I can see at present for large-scale production, for organized industry on the land, lies in the advances that science can make. It is research alone that will enable the big agricultural business to compete with the excessive labour of the one-man farm, to pay wages and give conditions of life to its work-men equal to those prevailing in the urban industries. It becomes then a matter of the first import to the growth of civilization itself, not merely to agriculture, that agricultural research should be encouraged.

We may consider research from two points of view. In the first place, it is an intellectual affair carried out by the individual in response to the insatiable curios-

ity of the mind about its surroundings and its own existence. As such, it proceeds from an artistic impulse, it is not under control and it is not amenable to considerations of utility. Just as some men must write poems or paint or make music, as other men find themselves compelled to speculate, to become philosophers or metaphysicians, so similarly the class of men we are considering must investigate nature.

So far I have only been considering research from its intellectual side as a response to man's curiosity, but the nineteenth century proved it had also a practical side inasmuch as it led to an enormously increased control over the forces of nature. I need not sing the praises of what has been effected by steam, by electricity, by modern medicine; willynilly the results are being incorporated in our daily life. Research leads to efficiency, and efficiency is a means of making money. The modern state must cultivate research if it is to become efficient and survive in the world's competition; hence all are agreed now on the endowment of research, and since in farming there are no great business corporations agricultural research must for many years to come be maintained by the state.

If then, research is to become of such importance to the state, it behoves us to ensure conditions for the research worker under which discoveries are likely to be produced. To do this properly we must understand the psychology of the investigator. If it is true that research, like art, grows by a process of intuition, we can no more organize it into existence than we can organize the output of poetry. Nor are we likely to obtain it by a system of prizes, of rewards, commensurate to those obtained in the great professions, in industry or commerce. What we can do is to contrive sheltered places in our community in which research workers can live. We can not guarantee results, but we may wait in faith because as we have said the impulse to

make discoveries is fundamental in man's mind. Now the sheltered places in which the research worker can live are the universities.

One last word, the state must have research in order to obtain efficiency, but does mankind really care about efficiency? At bottom man does not, he wants to "loaf and possess his soul." Efficiency is a beautiful word, but efficiency to what end? If pursued for its own sake it may become a curse.—*Science.*

RESUME OF MINUTES OF MEETINGS OF THE BRITISH GUIANA SUGAR PLANTERS EXPERIMENT STATIONS COMMITTEE FOR OCTOBER AND NOVEMBER, 1925.

The Committee met on Monday, the 26th October, 1925, when the following were present:—Sir John Harrison, Chairman; The Hon. W. M. B. Shields, Messrs R. Strang, D. Clark, R. P. Daggett with the Superintendent and Secretary.

The monthly statement of receipts and expenditure having been passed, the Chairman mentioned that owing to the strict economy exercised at the Station, the expenditure was considerably less than estimated. Some discussion ensued as the object for which the station was conducted. The meeting again decided that the station was primarily for the raising of seedlings with a view of obtaining a better cane than the D.625 and that work in connection wih mechanical tillage could be con ducted on the estates where better facilities offered.

The Superintendent stated that about 30 to 40 of the seedlings produced in 1922 showed promise. Arrows were being collected from these and would be sown in due course.

The Committee met again on the 23rd November when the following attended:—Sir John Harrison,

Chairman; Hon. W. M.. B. Shields, Messrs. G. E. Anderson, R. Strang, A. E. Craig, W. S. Jones and the Superintendent and Secretary.

The Chairman read portions from Mr. Stockdale's speech in the "Ceylon Observer" relative to the establishment of a Tea Research Institute. At the request of the members present the Chairman promised to have extracts typed and circulated to them.

The reports of the Superintendent, Chemist and Field Manager having been circulated were discussed. The estimates of expenditure at Sophia for November were approved and the monthly statement of receipts and expenditure noted. As regards the weather, the Chairman remarked that the indications were for a pro longed drought. He had recently compiled an Abstract of the Observations on the Climate of British Guiana from 1846 to date and would send copies to each of the members.

A letter from the Field Manager to the Superintendent concerning the condition of tops sent to Pln. Anna Regina was noted; the Chairman promised to deal with the matter at the meeting of the Essequebo Land Settlement Committee that day.

The Committee decided with regret to dispense with the services of its Field Manager, Mr. J. P. Bastiaans, the latter having become incapacitated through ill health. He was granted an extension of three months half pay leave to the end of December.

The Chairman mentioned that he had recently pre pared certain information for the use of the East Indian Immigration Commissioner which might be of interest to the members, and promised to have copies made for circulation to them.

The Superintendent was granted one month's leave of absence to go to Barbados in March for the benefit of his health.

The Chemist was granted similar leave in December.

FOOD PLANTS OF BRITISH GUIANA.

By Sir John B. Harrison, C.M.G., M.A., Director; and the late C. K. Bancroft, M.A., F.L.S.; Assistant Director, of the Department of Science and Agriculture.

This colony lying between latitude 0° 41′ N. and 8° 33′ 22″ N., has a depth from North to South of about 500 miles, a seaboard of about 270 miles and occupies in the north-east of South America an area approximately equal to that of Great Britain.

The chief agricultural industries are sugar, rice cacao, coffee, coconuts, rubber; limes and ground provisions. The principal exports derived from these are sugar and its by-products (rum, molasses and molascuit) rice, coffee and coconuts. But in addition to the plants from which this produce is obtained there are a large number of species well suited both to the soil and the climatic conditions of the colony, which would repay cultivation on a much larger scale than exists in the colony at the present time. British Guiana imports large quantities of foodstuffs of vegetable origin, prominent among which are grain and flour, ground provisions of various kinds, more particularly potatoes, both ordinary and sweet, pulses, fruit; cattle foods; etc.

In the following pages of this article will be given a list of the food plants occurring in British Guiana with short notes on their uses. These, if planted in sufficient quantity under suitable conditions and properly tended would not only render this colony independent of any external supply of vegetable food, but would

leave a large surplus for export to other countries. The plants are dealt with under two heads, *viz.*, I., Field Crops, Vegetable and Miscellaneous Plants, and II. Fruits and Spices.

EXPRESSION OF FOOD VALUE.

The difference in the capacity of different foods for yielding heat or energy renders it desirable to express the fuel or food value of each either in terms of an absolute unit, as the calorie, or in terms of an arbitrary expression dependent on the relative proportions in which the nutritive constituents are present. In the former case the fuel value is the amount of heat, expressed in calories, equivalent to the energy which could be obtained if all of the nutrients present were thoroughly digested. The latter are usually expressed as "Nutritive Ratio" (N.R.) by which is meant the proportion that the sum of the starch or carbohydrate content and two and a half times the fat content bears to the crude protein content taken as unity, $\frac{\text{Carbohydrate} + 2.5 \text{ Fat}}{\text{Protien.}}$ "Fat Ratio" (E.R.), the proportion that the starch or carbohydrate content bears to the fat content taken as unity, *i.e.*, $\frac{\text{Carbohydrate}}{\text{Fat}}$: "Food Units" (F,U.) the sum of the starch or carbohydrate content added to two and a half times the sum of the fat and protein content, *i.e.*, Carbohydrate + 2·5 (Fat + Protein).

The value of a calorie in terms of Rubner's units (R.C.) is obtained by multiplying the sum of the Protein and Cardohydrates dy 4.1 and adding the result to the Fat multiplied by 9.3, *i.e.*, 4.1 (Carbohydrate + Proteiu) + 9·3 Fat.

Wherever it has been possible to do so the fuel value and the other values mentioned above have been included in this article. The most valuable of these expressions are the fuel value in Rubner calories and the "Nutritive Ratio."

I.

FIELD CROPS, VEGETABLE AND MISCELLANEOUS PLANTS.

Aniseed : ***Tragium anisum.*** An annual herb, native of Egypt, employed for garnishing dishes, grown in kitchen gardens, but only in small quantity. It is propagated from the seed, which may be sown in a box or pan. The young plants when strong enough may be transplanted into a bed about six inches apart.

Arrowroot: *Maranta arundinacea.* A perennial herb native of tropical America, growing to a height of about three feet, possessing fleshy rhizomes from which the arrowroot of commerce is obtained. Although it is not cultivated now in British Guiana to any appreciable extent, there was some fifteen years ago a cultivation of fair size on the West Coast of Berbice. The plant requires a light well-drained soil. A return may be expected eleven months after planting. The rhizomes contain about 20-25% of starch, but little more than 15-18% is usually recoverable, yielding 7 cwt. of arrowroot per acre. Under very favourable conditions this return may be doubled.

The average compositions of the arrowroot plant and starch are:—

	Plant	Starch
Moisture	63.4	13.6
Protein	1.6	.9
Fat	.2	.3
Starch, Sugar, etc.	30.0	84.6
Fibre	3.9	.3
Ash	.9	.3
N.R.	19.0	9.5
F.R.	150.0	282.0
F.U.	34.4	88.0
R.C.	131.	353.

Artichoke: *Helianthus tuberosus.* The Jerusalem artichoke is the tuber of a perrennial sun-flower-like plant, native of Canada and the middle parts of the

United States of America. The tubers may be cut to single eyes and planted like a potato. The plant requires a friable loamy soil for its successful cultivation. A crop can be obtained three months after planting. The composition of the tuber is:—

Moisture	80.0
Protein	2.0
Fat	.5
Starch, Sugar, etc.	14.4†
Fibre	2.0
Ash	1.1
N.R.	7.8
F.R.	28.8
F.U.	20.6
R.C.	72.

Asparagus (*Asparagus officinalis.*) A perennial erect herb, said to be indigenous to Europe and Asia, growing to a height of 3–4 feet, cultivated for its young tender shoots. In kitchen gardens, on loose soil it makes a fair growth, but the shoots seldom attain a satisfactory size.

Asparagus Bean—see Bean, Yard.

Bamboo: *Bambusa* spp. The young shoots of some species are used in making pickles and chutney.

The seeds of *Bambusa arundinacea* have been employed in India on several occasions to substitute a deficient millet or rice crop. Their composition when husked is:—

Moisture	11.0
Protein	11.8
Fat	.6
Starch, Sugar, etc.	73.7
Fibre	1.7
Ash	1.2
N.R.	6.4

† Sugar, inulin and levulin.

F.R.	...	...	...	122.8
F.U.	...	...	...	104.7
R.C.	...	...	...	356.

Basil: *Ocymum basilicum.* Said to be native of the East Indies. Useful for seasoning, like sage or thyme. The seed should be sown in boxes and the young plants transplanted to a well-drained bed.

Beans—Bonavist: *Dolichos Lablab.* Annual or perennial twining vines. The most useful is a small annual. The beans are employed as a vegetable.

Dholl: *Phaseolus Mungo.* The green pods and ripe seeds are eaten.

Beans—Goa: *Psophocarpus tetragonolobus.* A perennial climber bearing fruit from 9-10 inches long, each with four wings. The pods when immature are sliced and cooked like French or Kidney beans. Introduced into the colony from India.

Guar: *Cyamopsis psoralioides.* A robust annual, probably native of India. The pods are employed in the same manner as the above.

Kidney or French: *Phaseolus vulgaris.* An annual, cultivated for its edible pods which are used as a vegetable when immature. Several varieties occur.

Lima: *Phaseolus lunatus.* A robust annual, cultivated for its edible seeds.

Scarlet Runner: *Phaseolus multiflorus.* A perennial climber whose pods are used like those of the Kidney bean.

Soya: *Glycine Soya.* A sub-erect annual herb, native of Southern Europe, cultivated for its edible seeds.

Sword: *Canavalia ensiformis.* An annual climber, the ripe seeds and immature fruit of which are employed as vegetables.

Yard Long *Dolichos sesquipedale.* An annual climber sub-erect, with flexuose stems. The immature fruit and seeds are eaten as a vegetable.

The above beans yield returns in from three to six months. They are the commonest beans suitable for cultivation in kitchen gardens in the colony. There are several others cultivated in tropical countries which may

with advantage be grown in this colony, such as Sutri (*Phaseolus calcaratus*) Tepary (*Phaseolus acutifolius*), Moth (*Phaseolus aconitifolius*) Ngena (*Phaseolus* sp.), Horse (*Dolichos biflorus*), Velvet (*Stizolobium aterrimum*) Bambarra (*Voandzeia subterranea.*)

The following table shows the composition and the food value of some of them :—

	IMMATURE PODS.	BEANS.				
	Kidney.	*Bonavist.*	*Dholl.*	*Lima.*	*Soya.*	*Sword.*
Moisture	89·8	14·6—12·1	10·8	13·3	10·3	12·6
Protein	2·4	17·1—22·4	22·2	19·7	43·6	25.0
Fat	·4	1·4—2·3	2·7	1·2	15·5	2·8
Starch, Sugar etc.	1·8	53·5—57·4	54·1	57.8	21·0	48 6
Fibre	4·8	5·0—6·5	5·8	4·3	4·4	7·7
Ash	·8	3·4—3 7	4·4	3·7	5·2	3·4
N.R.	1.2	3·3—2·8	2·7	3·1	1·4	2·2
F.R.	4·5	38·0—25·0	20·0	48·2	1·4	17·3
F.U.	8·8	99·8-122·3	116·4	109·9	168·7	118 1
R.C.	21·0	300·—351·	338·	329·	409·	328.

Boulanger : *Solanum Melongena.* An erect, herbaceous annual, 2-3 feet tall, bearing roundish-oblong purplish fruits, forming an important vegetable in this colony. Grown readily from seed. The plant requires a friable loamy soil.

Breadfruit : *Artocarpus incisa.* A native of the Pacific Islands grown in fair quantity in the colony. An evergreen tree bearing large round fruits employed as a vegetable. The tree is best grown on a friable soil of good depth. The compositions of meal and flour made from the fruit are as follows :—

	Meal	*Flour*
Moisture	12.1-13.9 ...	14.3
Protein	3.5- 5.3 ...	1.0
Fat	1.3- 1.4 ...	.2
Starch, Sugar, etc.	77.1-61.6 ...	83.8
Fibre	4.0-14.8 ...	.2
Ash	2.0- 3.0 ...	.4
N. R.	24.2-12.3 ...	84.3
F. R.	6.0-44.0 ...	419.0
F. U.	89.0-78.4 ...	86.8
R. C.	342. -287 ...	390.

26 MAY

Cabbage. *Brassica oleracea.* A biennial herb, native of Europe, grown as an annual for its succulent leaves which form a "head." The composition of the shoots and leaves is:—

	White.	*Red.*
Moisture	90.1	90.0
Protein	1.8	1.8
Fat	.2	.3
Starch, Sugar, etc. ...	2.8	2.5
Fibre	3.9	4.6
Ash	1.2	.8
N.R.	1 83	1.77
F.R.	14.0	8.3
F.U.	7.8	7.7
R.C.	21.	20.

Cabbage Palm: *Oreodoxa oleracea.* A tall erect palm whose immature inflorescences are used in the making of pickles.

Calalu. Giant cockscomb: *Celosia cristata,* var. *major.* An erect herb growing from 3-4 feet high. The young leaves are employed as a spinach. It is said to be the best of all calalus.

Green: *Amaranthus viridis.* An erect herb occurring in two varieties, a larger and a smaller. The tops of the shoots are used as a spinach.

Indian Kale: *Xanthosoma atrovirens.* A low-growing perennial. The young leaves are used as a spinach.

Kale: *Colocasia nymphaefolia.* Similar to the above.

Spanish: *Phytolacca octandra.* A succulent plant with a trailing stem employed as a spinach.

Water: *Colocasia antiquorum.* Similar to Kale.

The compositions of the shoots of Indian Kale and Spanish Calalu are:—

	Indian Kale	*Spanish Calalu*
Moisture	89.4	95.5
Protein	2.5	1.1
Fat	.8	.2
Starch, Sugar, etc. ...	4.6	1.7

Fibre	1.1	.3
Ash	1.6	1.2
N.R.	2.6	2.1
F.R.	5.7	8.5
F.U.	12.9	4.9
R.C.	36.	13.

Carrot: *Daucus Carota.* A biennial herb, native urope, cultivated as an annual for its edible roots. plant is best grown on a loose friable or sandy loam. Carrot roots have the following composition:—

Moisture	90.3
Protein	1.2
Fat	.3
Starch, Sugar, etc.	4.6
Fibre	2.6
Ash	1.0
N.R.	4.4
F.R.	15.3
F.U	8.3
R.C.	26.

assava: *Manihot utilissima.* A perennial, woody , growing with an erect stem up to 9 feet in height, ive of tropical America, cultivated for its tuberous s from which bread, starch and other products are le. It is one of the principal sources of carbohydrate l in the colony. A crop is obtained in 6–8 months, produces 4-8 tons of tubers per acre. There are kinds, the "bitter" and the "sweet." The former iore hardy and gives the higher returns per acre. compositions of cassava and its products are:—

	Roots.	*Meal, dried.*	*Chips, Kiln dried.*	*Bread.*	*Starch.*	*Bitty.*	*Tapioca.*
sture	64·4	11·4	·6	10·2	15·8	10·9	13.7
tein	1·4	2·1	1·3	1·3	·4	3·6	.5
	·4	1·1	1·6	·6	·2	·7	·3
ch, Sugar, etc.	30·4	82·1	91·8	81·9	83·4	76·0	84.1
re	2·7	1·8	2·9	4·8	...	6·1	·7
	·7	1·6	1·8	1·1	·2	2·7	.7
.	22·4	40·4	73·7	64·3	192·0	21·7	184·4
.	76·0	74·6	51·1	131·7	417 0	108·6	280·3
.	34·9	90·1	99·9	86·8	85·6	86·8	86·0
.	134	355	383	348	345	333	348

Celery: *Apium graveolens.* A biennial herb, native of Europe, cultivated for its leaf-stalks which are eaten cooked or uncooked.

Chrystophine: *Sechium edule.* A perennial climber bearing furrowed fruits, 3-4 inches long, employed when immature as a vegetable.

Corn. Guinea: *Sorghum vulgare.* An annual grass; native of India, extensively cultivated in the West Indies but only in very small quantity in British Guiana. The high food value of the grain renders it an important article of food in several countries in the world. A good average return from an acre is 50 bushels of grain. It gives a crop in about five months. Although it will give good returns on a wide range of soils, it thrives best on a loose friable one. An average composition of the grain is:—

	Not Hulled.	*Hulled.*
Moisture	10.5	12.0
Protein	7.5	8.0
Fat	1.6	2.0
Starch, Sugar, etc. ...	67.4	76.4
Fibre	9.0	1.0
Ash	4.0	1.0
N.R.	9.5	10.1
F.R.	42.1	38.0
F.U.	90.1	101.0
R.C.	322	362

Imphee: *Sorghum saccharatum.* One of the millets closely allied to the above.

Indian or Maize: *Zea Mays.* An annual grass, whose grain is an important article of food in several parts of the world. It yields a crop in 4 months of 16-25 bushels per acre. The following are average compositions of maize products:—

	Flour.	*Meal.*	*Cornflour (Starch).*	*Bran.*
Moisture	12·6	9·7	14·1	12·5
Protein	8·7	12·7	·9	9·9
Fat	2·0	1·2	1·2	3·6
Starch, Sugar etc.	74·7	74·5	83·6	61·5
Fibre	1·0	·3	·1	9·5

Ash	1·0	·6	·1	2·8
N.R.	9·2	5·9	96·2	7·1
F.R.	37·3	62·1	70·0	17.1
F.U.	101·7	106·2	88·8	95·3
R.C.	361	356	357	326

Cucumber: *Cucumis sativa*: A herbaceous climber, probably native of the East Indies, cultivated for its fruits which are used as a vegetable when immature.

The composition of the immature fruit is:—

Moisture	96.5
Protein	.5
Fat	.2
Starch, Sugar, etc.	1.5
Fibre	.8
Ash	.5
N.R.	4.0
F.R.	7.5
F.U.	3.2
R.C.	10.

Dholl.—see Bean, *Phaseolus Mungo*.

Eddoe.—*Colocasia esculenta*: A perennial herb, native of India, cultivated as an annual for its rhizomes which are starchy. It yields a crop in 5-6 months of 1½ to 2 tons of tubers. An average composition of the tubers is:—

Moisture	91.6
Protein	.3
Fat	.1
Starch, Sugar, etc.	5.0
Fibre	1.7
Ash	1.3
N.R.	17.7
F.R.	50.7
F.U.	6.0
R.C.	22.

Egg-plant.—see Boulanger.

Endive.—*Cichorium Endiva*: An annual herb grown for its leaves which are employed in a similar manner to lettuce in making of salads.

Fennel.—*Foeniculum vulgare*: A perennial, native of Europe, employed for garnishing dishes like parsley.

French Bean.—see Bean, French.

Garlic.—*Allium sativum*: A perennial herb, cultivated for its bulbs which are employed for seasoning.

Giant Cockscomb.—see Calalu.

Ginghee.—*Luffa acutangula*: A herbaceous climber, producing green fruits which are eaten as a vegetable when immature in a similar manner to squash.

Goa.—see Bean.

Gourd.—*Luffa cylindrica*: Similar in appearance and uses to Ginghee.

Green Calalu.—see Calalu.

Ground Nut.—*Arachis hypogœa*: An annual herb, grown for its oily seeds. And oil used in cooking is expressed from the seeds. The yield per acre of shelled seed is about ½ to ¾ ton, a crop being obtained 4—5 months after planting. The composition of the seed is:—

Moisture	7.5
Protein	27.5
Fat	44.5
Starch, Sugar, etc.	15.7
Fibre	2.4
Ash	2 5
N.R.	4.6
F.R.	.3
F.U.	195.6
R.C.	591.

Guar Bean.—see Bean.

Guinea Corn.—see Corn.

Hog Tannia: *Colocasia indica*: Similar to the Tannia, but stronger and coarser in growth and with a bare stem of 2 to 3 ft. high. The plant does not produce many tubers. The whole stem is used for food. The composition of the root-stock is:—

Water	91.56
Oil, Fats	.08
Albuminoids	.27
Sucrose	trace.
Glucose	.36
Starch	.94
Gums, Pectose, etc.	1.11
Fibre	4.49
Ash	1.19

Horse Radish.—*Cochlearia Armoracia*: A perennial herb, native of Europe, cultivated for its fleshy roots which are employed for garnishing dishes.

Imphee.—see Corn.

Indian Corn.—see Corn.

Job's Tears.—*Coix Lachryma-Jobi*: An annual grass, 3 to 5 feet high, bearing hard rounded grains. The food value of the grains husked is shown in the following table:—

Moisture	15.8
Protein	18.8
Fat	6.2
Starch, Sugar, etc.	59.6
Fibre	1.3
Ash	3.4
N.R.	4.1
F.R.	9.6
F.U.	125.2
R.C.	379.

Kale.—see Calalu.

Kidney Bean.—see Bean.

Kohl-Rabi.—*Brassica oleracea* var. *caulo-rapa*: A biennial, cultivated as an annual for its fleshy underground stem which is employed as a vegetable. The composition of the tuber is:—

Moisture	86.7
Protein	2.9
Fat	.3
Starch, Sugar, etc.	8.3
Fibre	.6
Ash	1.2
N.R.	3.1
F.R.	27.7
F.U.	16.2
R.C.	49

Leek.—*Allium Porrum*: A perennial herb, native of Europe cultivated as an annual for its fleshy leaves and stems.

Lettuce.—*Lactuca sativa*: A herbaceous annual whose succulent leaves are used in making salads and for similar purposes.

Loofah.—see Gourd.

Lotus.—*Nelumbium speciosum*: A perennial herb, aquatic, bearing large seeds embedded in a cone-shaped fruit. The seeds are either eaten raw when immature or roasted when ripe.

Their composition is:—

Moisture	12.2
Protein	17.7
Fat	2.4
Starch, Sugar, etc.	62.2
Fibre	1.7
Ash	3.8
N.R.	3.9
F.R.	25.9
F.U.	112.5
R.C.	350.

Manicole.—*Euterpe edulis*: A medium-sized palm whose terminal bud or "cabbage" is employed as a vegetable. It is of common occurrence near water-courses in several parts of the colony.

Mint.—*Mentha viridis*: A perennial herb, native of Europe, whose leaves are employed for flavouring purposes.

Mushroom.—*Agaricus campestris*: An edible fungus. A small variety may commonly be found in fields at certain periods of the year. It is of good flavour.

Nipa.—*Nipa fruticans*: A low growing swamp palm with large leaves, yielding a sap obtainable from the young inflorescence from which sugar and a spirit known as "arrack" are made.

Okra.—*Abelmoschus esculentus*: An annual coarse herb bearing edible pods which are used as a vegetable when immature. The composition of the pods is:—

	Range of Composition.
Moisture	80.7-90.2
Protein	1.6- 4.2
Fat	.2- .4
Starch, Sugar, etc.	4.0-12.1
Fibre	1.2- 3.4
Ash	.6- 1.4
N.R.	2.8- 3.1
F.R.	20.0-32.5
F.U.	8.5-23.6
R.C.	24. -62.

Onion.—*Allium Cepa*: A perennial herb, cultivated s an annual for its fleshy bulbs which are employed or seasoning purposes.

Parsley.—*Carum Petroselinum*: A herb, native of urope, used for garnishing dishes.

Pea.—Blackeye: *Dolichos sphaerosperma*: An nnual climber who seeds are used as a vegetable.

Cow: *Vigna Catjang*: An annual, bean-like ramb- ng vine. The pea furnishes a good human food.

Increase: Similar to Cow Pea in habit and uses.

Pigeon: *Cajanus indicus*: A perennial shrub whose ed are eaten when nearly mature. It gives a crop in 1—12 months of 3—4 cwt. per acre. The composition f the peas is:—

Moisture	10.5
Protein	22.3
Fat	2.1
Starch, Sugar, etc.	60.9
Fibre	1·2
Ash	3.0
N.R.	2.9
F.R.	29.0
F.U.	121.9
R.C.	361.

Pepper: *Capsicum annuum*: Herbaceous or shrubby nnuals or perennials natives of tropical America, cultiva- d for their fruits which are employed principally for ressing dishes.

Pumpkin.—*Cucurbita Pepo*: An annual climber, rown for its large fruits which are employed as a vege- ble. A vine yields under favourable conditions a crop about 6 months of 2 cwt. of fruits. The composition f the fruit is:—

Moisture	88.9
Protein	.7
Fat	.3
Starch, Sugar, etc.	9.0
Fibre	.5
Ash	.6
N.R.	14.0

F.R.	30.0
F.U.	15.7
R.C.	42.

Purslane: *Portulaca oleracea*: A herb possessing succulent stems and leaves which are sometimes used in making salad. Grows wild in many parts of the colony. The composition and food value are similar to those of Calalu.

Rice: *Oryza sativa*: A member of the grass family; an annual cultivated for its grain, which constitutes a staple article of diet, introduced into British Guiana in 1782 during the French occupation. In 1898, only 6,500 acres of rice were under cultivation in the colony, while at the present time more than 30,000 acres are cultivted. The plant yields a crop in 4 to 5 months. In some part of British Guiana two crop are obtained annually; with proper irrigation a return per acre of 42 cwt. of padi is obtained. The average return per acre over the whole colony over large areas is 32 cwt. The varieties of rice are legion: those cultivated most commonly in the colony are Demerara Creole, Berbice Creole, No. 75. and H. 6 The husked grain is employed in many ways as food—as a cooked vegetable, in cake, bread, pudding, etc. The food values of padi and of rice are indicated in the following tables:—

PADI.

	General.	*Demerara Creole.*	*Berbice. Creole.*	*No. 75.*	*Demerara Hill Rice.*	*Wild. Indian.*
Moisture	12.6	13.6	10.3	13.1	12.3	11.9
Protein	6.1	6.5	8.4	6.6	6.5	9.8
Fat	2.0	2.2	2.9	2.3	2.6	.8
Starch, Sugar, etc,	74.1	64.9	68.6	64.0	66.2	73.3
Fibre	4.0	7.5	2.5	8.6	6.9	2.1
Ash	1.2	5.3	3.4	5.4	5.5	2.1
N.R.	13.0	10.8	9.0	10.6	11.2	7 6
F.R.	37.0	29.5	23.6	17.8	25.5	91.6
F.U.	94.8	86.6	96.9	86.3	89.4	99.8
R.C.	347	313	'43	311	332	348

MILLED RICE.

	British Guiana.	*Rangoon.*	*Carolina.*	*East Indian.*		*Japan*	*Polished*
	White	*White*	*White*	*White*	*Brown*	*Brown*	
Moisture ...	11.2	14.4	12.2	12.7	12.0	11.1	12.4
Protein ...	7.8	6.9	7.8	6.9	8.0	8.5	7.5
Fat ...	.5	.5	.4	.2	2.0	1.9	.4
Starch, Sugar, &c	79.4	77.6	78.9	79.1	75.0	76.0	78.9
Fibre ...	.3	.1	.3	.3	1.0	1.0	.4
Ash ...	.8	.4	.5	.6	1.0	1.5	.5
N.R. ...	10.3	11.4	10.2	11.5	10.1	9.5	10.6
F.R. ...	159.0	155.2	197.2	395.5	38.0	40.0	197.0
F.U. ...	100·0	96.2	99.4	97.0	105.0	102.	98.5
R.C. ...	362	351	359	354	363	364	357

Sage: *Salvia officinalis*: A herb employed for flavouring.

Sago: *Metroxylon Rumphii*: A palm of medium size whose trunk yields the sago of commerce. The range of composition is:—

	Ordinary Sago.	*Pearl Sago.*
Water ...	12.81—16.8	... 12 —15
Protein ...	.2— 2.1	... ——
Fat ...	.1— .2	... ——
Starch, Sugar, etc.	77.0—82.3	... 84.9—87.8
Fibre ...	.1— 4.0	... ——
Ash ...	.6— 3.8	... .1— .2

Seaside Purslane: *Sesuvium portulacastrum*: A succulent herb, commonly found on the coastlands of the colony. The stems are used as a vegetable. The composition and food value are similar to that of Calalu.

Scarlet Runner: see Bean.

Shallot: *Allium ascalonicum*: A perennial herb grown as an annual for its fleshy bulbs which are employed for flavouring purposes in a similar manner to the onion.

Soya: see Bean.

Spanish Calalu: see Calalu.

Squash: *Cucurbita maxima*: A herbaceous climber producing fleshy fruits which are used as a vegetable,

The composition and food value are similar to those of the cucumber.

Sugar Cane: *Saccharum officinarum*: A member of the grass family cultivated for the sugar-containing sap or "juice," contained in the stems, from which the cane sugar of commerce is manufactured. The plant is grown on a large scale in the colony, nearly 60,000 acres being cultivated. More than one-thirds of the colony's population is directly engaged in the industry. Sugar and its by-products, rum, molasses and molascuit contribute 80% of the total value of the exports of British Guiana. The plant yields a return in 14 months. An average return for the colony is 1.8 tons of cane sugar per acre.

Sweet Potato: *Ipomoea Batatas*: A perennial creeper, native of tropical America, cultivated as an annual for its tuberous roots. A crop is obtained in 4 to 5 months of 2 to 4 tons of roots per acre. The plant is propagated by cutting up the tubers which produce numerous shoots, or by planting cuttings of the stem. The roots, which have a starch content of about 20% are employed as a vegetable. Composition:—

	Tuber.			*Meal.*	*Starch.*
Moisture ...	73.1	to	60.2	12.0	13.7
Protein	.6	„	4.4	5.1	.8
Fat	.4	„	.8	1.2	.1
Starch, Sugar, etc.	13.3	„	33.8	76.9	85.3
Fibre	.6	„	17.8	1.9	
Ash	1.1	„	1.3	2.9	.1
N.R.	7.7	„	23.3	15.6	101.9
F.R.	33.2	„	54.7	64.1	853
F.U.	15.8	„	44.8	93.7	87.7
R.C.	112	„	135	347	354

Talipot: *Corypha umbraculifera et* spp: A tall-growing palm flowering when 25 to 35 years old. Starch is obtainable from the trunk, as in the sago palm.

Tannia: *Colocasia macrorhiza*: A perennial herb grown as an annual for its starchy tubers. A crop of 1½ to 2 tons per acre is obtainable in 9 to 12 months.

The plant is propagated by planting small tubers. The tubers, which constitute an important article of diet, have the following composition:—

Moisture	78.4
Protein	2.7
Fat	.3
Starch, Sugar, etc.	16.1
Fibre	2.0
Ash	.5
N.R.	6.2
F.R.	53.7
F.U.	23.5
R.C.	80.

Thyme: *Thymus citriodorus*: Used in the same manner as Sage.

Tomato: *Lycopersicum esculentum*: An annual coarse herb, native of South America cultivated largely, for its sub-acid fruits which are eaten cooked or uncooked. Propagated by seed which is sown in a box and transplanted to a well-drained bed. The fruits have the following composition:—

Moisture	93.4
Protein	1.0
Fat	.2
Starch, Sugar, etc.	4.0
Fibre	.8
Ash	.6
N.R.	4.5
F.R.	20.0
F.U.	7.0
R.C.	22.

Turnip: *Brassica rapa*: A perennial resembling the radish. The plant is not usually a success in the Tropics.

Water Calalu: see Calalu.

Yam: *Dioscorea alata*: A perennial climber introduced from the East, and cultivated for its edible tubers. Several varieties occur, the best of which is

probably that known as "Buck Yam." The plant yields a crop of tubers, in 9 to 11 months, of $1\frac{1}{2}$ to 3 tons, which have the following composition:—

Moisture	74.0
Protein	2.0
Fat	.5
Starch, Sugar, etc., ...	20.0
Fibre	2.2
Ash	1.3
N. R.	10.6
F. R.	40.0
F. U.	26.2
R. C.	73.

Yard-Long Bean; see Bean.

II.

FRUITS AND SPICES.

Abai: see African Oil Palm.

Acquero: *Astrocaryum Tucuma*: A native palm bearing yellow fruits with an oily pericarp.

African Oil Palm: *Elaeis guineensis*: A medium sized palm native of West Africa, whence it was introduced by slaves into this colony and planted in fair quantity near to the coastlands. An oil employed principally as a lubricant is extracted from the pericarp of the fruit. This oil is also used as a fat in cooking. The oil derived from the kernel is employed in the making of perfumes, etc.

Akee: *Blighia sapida*: A tree bearing bright scarlet fruits 2 to 3 inches long, said to be native of West Africa. The white inner portion of the fruits is eaten either alone or used in making a sauce.

Allspice: *Eugenia Pimenta*: The "Bay" tree of the West Indies which furnishes the allspice of commerce, consisting of the dried fruits. The produce is sometimes large. The odour and flavour of the berries, due to a volatile oil, resemble a combination of cinnamon, cloves and nutmeg, hence the name allspice. Allspice is largely used for flavouring purposes. The oil is occasionally employed as a carminative.

Almond or Seaside Almond; *Terminalia Calappa.* A tree producing oval-flattened fruits whose outer portion is edible.

Annatto. *Bixa Orellana.* A small tree bearing terminal clusters of spiny fruits containing small seeds used in colouring cheese and butter. Widely distributed, but here of no commercial importance.

Arabian Coffee. *Coffea arabica.* A native of Abyssinia, cultivated for its seeds from which the best coffee is made. The plant is grown in fair quantity in the lower reaches of the rivers of the colony, but is not so well suited to the conditions of soil, climate and labour as another variety—Liberian. The plant yields a crop in three years, when grown under favourable conditions, of 4 to 8 cwt. of dry coffee per acre.

Areca: *Areca Catechu*; A tall-growing palm, cultivated for its fruits, which possess astringent and aromatic properties. Though not grown to any large extent in the colony it is very largely employed by certain Eastern races in their native homes.

Avocada Pear; *Persea gratissima*; A medium to large sized tree bearing rounded or bottle-shaped fruits, green or purple, which are either eaten alone or used in the making of salads. The tree does not flourish on the heavy soil of the front lands but at some distance from the coast, on lighter land with a good depth of drainage, it often yields large crops. The composition of the fruit is as follows.—

Flesh, 65%; Rind, 10%; Stone, 25%. The flesh contains about 1.7% sugar, 10.5% oil, 5.7% protein, 4% fibre, and 2% ash.

Awarra: *Astrocaryum tucumoides*: A palm resembling closely the Acquero.

Balata: *Mimusops globosa*; The small, rounded fruits are gathered and eaten by native Indians in the forest. The tree is widely distributed in the colony, occurring most frequently on rising ground away from the water's edge, on the middle reaches of the rivers, but not infrequently on low land near the banks of creeks. The flowers emit an agreeable odour,

Banana: *Musa sapientum*: An annual possessing large leaves with well-developed sheaths, bearing elongated cylindrical fruits which are eaten fresh when ripe, or are sometimes dried and converted into meal or flour. Several varieties occur. The composition of the fruits of two common varieties and of the meal and flour are :—

	Chinese	*Jamaica.*	*Meal.*	*Flour.*
Moisture	67.1	75.8	12.8	10.9
Protein	5.0	1.3	1.6	.7
Fat	.2	.3	.3	.2
Starch, Sugar, etc.,	26.5	20.5	81.7	84.9
Fibre	.3	.7	.6	.7
Ash	.9	1.4	3.0	2.6
N. R.	3.5	16.5	49.1	120.0
F.R.	132.5	683.	172.3	424.5
F.U.	29.8	24.5	81.6	87.1
R.C.	131.	92.	344.	353.

Barbados Cherry : *Malpighia glabra :* A tree which is usually grown in the colony in hedges. It produces small, rounded acidulous fruits which are sometimes eaten fresh when ripe, but are more usually employed in the making of jams,

Barbados Gooseberry: *Pereskia aculeata :* A trailer bearing spines on stem and young branches, and producing very acid fruits.

Bay Tree : see Allspice.
Betel Nut: see Areca Nut.

Bilimbi: *Averrhoa Bilimbi*; A tree native of India and China, bearing on the stem and branches numerous fruits resembling small cucumbers: employed in making pickles.

Brazil Nut; *Bertholletia excelsa*; A large tree bearing hard, rounded fruits containing 18 or more nuts which are of excellent flavour. Said to be native of Guiana, but only two trees (cultivated) are known to occur in this colony.

The kernels of the seeds have the following composition:—

Water	6.40
Fat	70.16
Albuminoids	12.33
Amides	.25
Glucose	.15
Pectose	3.98
Digestible Fibre	2.08
Woody Fibre	2.08
Mineral Matter	3.34

The kernels of seeds of Suwari Nut (*Caryocar tomentosum*) have a similar composition.

Cacao: *Theobroma Cacao.* A tree of medium size cultivated formerly by the Dutch in quantity principally on the banks of the river Berbice, bearing large fruits containing seeds—"beans"—from which, when dried and cured, the cacao and chocolate of commerce are made. There are now about 2,000 acres under cultivation in the colony. The composition of the cured bean of two varieties is;—

	Forastero Amelonado		*Forastero Angoleta*
Moisture	7.2	...	6.3
Protein	10.7	...	8.6
Fat	40.7	...	52.1
Starch, Sugar, etc. ...	6.1	...	7.3
Fibre	17.1	...	11.9
Ash	4.5	...	3.1
Alkaloids	1.6	...	1.9
Astringent Matters, Pectin and Organic Matter	12.1	...	8.8

Carambola: *Averrhoa Carambola*: A tree bearing five-cornered channelled fruits, 3 to 4 inches long, of a pleasant acid taste, used in making preserves.

Cashew: *Anacardium occidentale*: A tall shrub or tree bearing fruits consisting of a "seed" (the true fruit) at the top and a fleshy portion below. The fleshy

portion is eaten fresh. The nuts, when cooked, have an excellent flavour.

Cherimoya: *Anona Cherimolia*: A small tree bearing heart-shaped sub-acid fruits of good flavour. Occurring only in gardens in the Colony.

Christmas Tree: *Pithecolobium dulce*: A medium-sized tree of Mexican origin, bearing pods which contain a white, edible pulp. It occurs in gardens in the Colony.

Chili Plum: *Spondias purpurea*: A medium-sized tree, native of Jamaica, bearing yellow fruits, one inch long, of pleasant flavour.

Cinnamon: *Laurus Cinnamomum*: A tree introduced from the East Indies but not grown in the colony to any appreciable extent. The bark constitutes the cinnamon of commerce.

Citron: *Citrus medica*: A small-sized tree bearing oblong fruits of varying size, the thick rind of which is candied.

Clove: *Caryophyllus aromaticus*; Introduced from the East Indies. The flower bud picked just before it is ready to open and dried in the sun constitutes the clove of commerce.

Coconut: *Cocos nucifera*: A tall palm bearing large, rounded fruits of which the kernel, known as "meat," is either eaten raw or exported when dry as copra. From this, oil, vegetable butter, etc., are made. The kernel is sometimes converted into meal after most of the oil has been expressed. There are 25,000 acres under cultivation in the colony. Mature trees yield 50 to 100 fruits on the average; and about 5,000 fruits are required to produce a ton of copra. The immature fruits contain a liquid which is a pleasant beverage. The composition of meat, copra and meal is:—

	Meat.	*Copra.*	*Meal.*
Moisture	39.8	3.4	11.4
Protein	3.4	5.4	19.5
Fat	46 1	73.7	15.7
Starch, Sugar, etc. ...	8.1	13.3	20.2
Fibre	1.9	3.0	27.5

	Meat.	Copra.	Meal.
Ash	.7	1.2	5.7
N.R.	36.3	36.6	3.1
F.R.	.2	.2	1.3
F.U.	132.4	211.2	108.3
R.C.	476	762	309

Coffee: see Arabian Coffee, Liberian Coffee.

Cokerite : *Maximilliana regia* : A large palm bearing clumps of numerous ovoid fruits of which the pericarp is eaten.

Custard Apple: *Anona reticulata*: A small, or medium-sized tree bearing rounded fruits about four inches in diameter, containing a yellowish-white pulp.

Date Palm: *Phoenix dactylifera*: Native of Egpyt. A few plants occur in the colony. The fruits form a staple article of diet in its native home. Although the palm fruits in some of the West Indian Islands, it rarely fruits in British Guiana.

Dunks: *Zizyphus Jujuba:* Native of India and China. A tree whose fruits, of the size of a large cherry, are borne on the branches at the basis of the leaves. The edible portion of the fruit is mealy and of acid flavour.

Fat Pork: *Chrysobalanus Icaco*: A large shrub bearing small rounded fruits of mealy consistency.

Forbidden Fruit: see Grape Fruit.

Geneps or Cheneps: *Molicocca bijuga*: A tree native of tropical America, bearing small green fruit, one inch long. The pulp is acidulous containing malic acid. A decoction of the bark of the tree is astringent and useful in cases of dysentery.

Ginger: *Zingiber officinale*: A perennial, member of the banana family, low growing, producing numerous rhizomes which when cured, constitute the ginger of commeree. A crop can be obtained, in 18 months, of about 4 tons of tubers per acre. Two varieties occur—the Chinese or common, and the Jamaica. Loose friable soil is required for their successful cultivation.

Golden Apple: *Spondias dulce*: A tall tree bearing sub-acid, yellow, rounded or oblong fruits, about two inches in diameter.

Governor's Plum: see Sidium.

Granadilla: *Passiflora quadrangularis*: A climber with square stems bearing large fruit about six inches long, and four inches or more in diameter, the pulp of which resembles the Simitoo.

Grape—Seaside: *Coccoloba uvifera*: A tree growing in its native habitat on the seashore, bearing large numbers of small reddish-purple berries of good flavour.

Grape Fruit or "Forbidden Fruit": *Citrus decumana* var. *Paradisi.* A tree resembling the Shaddock, bearing smaller, smooth rounded fruits whose pulp possesses an excellent flavour,

Grape Vine: *Vitis vinifera*: A vine bearing clusters of rounded, green or purple fruits which are either eaten fresh or employed in making wines, etc, For its successful cultivation good, rich, light soil is needed, The plant needs careful attention in regard to pruning and cleaning.

Guava. *Psidium guyava*: A loose, spreading tree of small to medium size, bearing green or yellow fruits usually the size of duck's egg; used principally in the making of preserves,

Flesh	85%
Skin	12%
Seeds	3%

Flesh contains 4.2% sugars,

Guinea Pepper. *Amomum Grana-paradisi.* A herbaceous ginger-like plant whose seeds, when freed from the husk, form a useful spice,

Hogg Plum. *Spondias lutea*. A tall tree bearing yellow sub-acid fruits of pleasant flavour,

Jak Fruit. *Artocarpus integrifolia*. A tree introduced from the Pacific Islands, bearing on the stem and lower parts of the branches, large, rough fruits, sometimes more than 20 inches long, containing seeds which resemble and are employed in a similar manner to the Bread Nut,

Jamoon: *Eugenia paniculata*: A quick-growing tree, introduced from the East, bearing round-oblong fruits of the size of a marble. The fruits are eaten fresh and are also employed in making a beverage.

Java Plum: *Syzygium Jambolanum*: A large spreading tree, native of the East Indies, bearing large numbers of small purple fruits which are astringent and are used in making a preserve.

Kola: *Kola acuminata*: A medium sized tree whose seeds are used as a condiment. The tree was formerly cultivated in fair quantity on the lower reaches of the rivers.

Lakocha: *Artocarpus Lakoocha*: A tree resembling somewhat in growth the Jak fruit, bearing on its branches reddish-yellow fruits whose surface is covered with small knobs. The fruits are of pleasant, sub-acid flavour.

Lemon: *Citrus Limonum*: Similar to the Citron, but bearing smaller fruits which are useful in the preparation of beverages, dishes, etc.

Liberian Coffee: *Coffea liberica*: When allowed to grow unchecked, this plant forms a tree of medium size, bearing rounded fruits whose seeds when cured constitute one of the common kinds of commercial coffee. The lower cost of cultivation, higher yield and cheaper picking and handling of the fruit render it more suitable for cultivation in British Guiana than the Arabian or Creole coffee. The area under cultivation in Liberian Coffee in the colony is being extended. There are now 5,600 acres under cultivation in coffee in the colony. The plant commences to bear in 3 to 4 years and when mature gives a return of 7 to 20 cwt. of dried coffee per acre. The value of coffee depends on its alkaloid content. Like tea, when taken in large quantities it may injuriously affect the nerves and stomach. The alkaloids are not present in the fresh seed as such, but are produced by the breaking down of more complex bodies.

Lime: *Citrus medica* var. *acida*: A tree resembling in habit the lemon, bearing small rounded acid

fruits from which "lime juice," is obtained. The juice is extensively used for cooking, flavouring, and drinking. There are 700 acres under cultivation in the colony in lime trees. The tree takes 8 years to reach maturity, but produces a crop in 3 to 4 years.

Litchi: *Nephelium Litchi*: A tree, native of China. bearing bunches of small fruits of excellent flavour. The tree is but little seen in the colony.

Locust: *Hymenoea Courbaril*: A tall tree, native of this colony, bearing pods which are filled with an edible pulp of pleasant flavour.

Loquat: *Eriobotrya japonica*: A tree, native of Japan, bearing small yellow sub-acid fruits, occuring only in Botanical Gardens.

Love Apple: see Tomato.

Malacca Apple: *Eugenia malaccensis*: A tree introduced from the East Indies, bearing pear-shaped fruits, used principally in making preserves.

Mammee Apple: *Mammea americana*: A native tree bearing large, rounded, brown fruits useful in making jams.

Mango: *Mangifera indica*: A tree of medium size, native of India, largely grown in the colony for its edible fruits. Great improvement in the quality of the fruit has been made from time to time by grafting. Many varieties occur. The composition of the fruit is as follows:—

Flesh	... ...	67—75% of the whole fruit
Stone	... ...	22—30%

The flesh contains 5.5 to 11.5% of sugars, according to the variety.

Melon—Musk: *Cucumis* Melo var. *moschata*: A creeper resembling the cucumber, bearing fruit like the European melon.

Water: *Cucumis citrullus*: Resembling the above.

Nutmeg Tree: *Myristica fragrans*: A tree, native of the East Indies, bearing yellow fruits the size of an egg. The aril present in the form of a network covering the seed, is the Mace of commerce; the seed is the Nutmeg. The plant is cultivated on the lower banks of the

rivers. The yields obtained, do not equal those of the plant grown at higher altitudes in the West Indian Islands.

Orange:—Sweet: *Citrus Aurautium*: A tree resembling the lemon, whose fruits vary a good deal in the thickness of the rind and quality of the pulp. The tree is cultivated fairly extensively on the lower banks of the rivers.

Seville: *Citrus vulgaris*: A tree resembling the above, bearing large fruits with a rough rind, used in the preparation of marmalade.

Tangerine: *Citris nobilis*: Resembles the above in habit, but bears a smaller fruit of excellent flavour.

It usually takes from five to seven years after planting for these trees to commence to bear fruit, although in some cases a small crop may be obtained sooner.

Parapee or Peach Palm: *Guilielma speciosa*: A native palm growing from 60 to 80 ft. high with its stem armed with rings of spines. The fruits, which are scarlet and orange in colour, are borne in large, drooping bunches, and may attain the size of an apricot. The fleshy outer portion of the fruit is rich in starch. It is eaten usually boiled or roasted. A beverage is also prepared by fermenting it. A meal obtained from the fruit is made into cakes. The composition of the flesh is:—

Water	47.93
Oils, Fats, etc.	5.30
Albuminoids	4.06
Sucrose	2.43
Glucose	1.22
Starch	19.50
Gums, Pectose, etc.	4.43
Fibre	13.77
Ash	1.36

Papaw: *Carica Papaya*: A tree, native of tropical South America, seldom exceeding twenty feet, whose stem is composed of soft wood, bearing rounded or oblong orange-yellow fruits of various sizes and excel-

lent flavour. The tree grows rapidly and is cultivated in the colony in fair quantity.

Flesh	... ...	65 per cent.
Rind	... ...	10 per cent.
Seed	... ...	25 per cent.

Flesh contains 5.6 per cent. sugar.

Peach or Mabola: *Diospyrus discolor*: A tree of medium size with dark green leaves, bearing rounded fruits the size of a large apple, velvety with cream-coloured flesh. Cultivated in the colony to a small extent. A native of the East.

Pineapple: *Ananassa sativa*: A biennial, with thin leaves of fibrous texture, bearing numerous short spines. The fruit produced at the end of the short stem, takes the form of a cone surmounted by a crown of small leaves. It possesses an excellent flavour and contains a highly digestive enzyme, capable of digesting 1,000 times its weight of protein in a few hours, hence its great value as a digestive. The fruit contains 85.8 per cent. water, 11.5 per cent. sugars, .4 ash, 1.5 per cent. fibre. The range of variation in the kinds of sugars is, fruit sugar, 1.7 to 9.7 per cent; cane sugar, 3 to 10.5 per cent.

Pimento: see Allspice.

Plantain: *Musa paradisiaca*: A plant with a herbaceous stem resembling somewhat closely the banana. The fruits, which are borne on a spike, are 9 to 10 inches long and about 1½ inches in diameter. They are used in the green state and also when ripe. They constitute a staple article of diet of the inhabitants of the colony. Meal and starch are also made from the fruits. The compositions of the unripe and ripe fruits, and of plantain flour and starch, are :—

	Unripe	*Ripe*	*Flour*	*Starch*
Moisture ...	62.8	75.0	11.8	14.9
Protein ...	1.6	1.3	3.7	.2
Fat ...	.4	.3	1.0	.4
Starch, Sugar, etc.	34.0	18.1	80.7	84.2
Fibre ...	.4	4.7	.9	.1
Ash ...	.8	.6	1.9	.2

N.R. ...	22.2	14.4	22.2	425.0
F.R. ...	85.0	60.3	80.7	210.5
F.U. ...	39.	22.0	92.5	85.5
R.C. ...	150	82.3	355	350

Plum rose: *Eugenia vulgaris*: A tree native of the East naturalised throughout the West Indies, bearing pear-shaped, greenish fruits, 1½ inches in diameter, of firm texture and somewhat sickly flavour.

Pomegranate: *Punica granatum*: A small tree, said to be native of Southern Europe, bearing fruits the size of a large apple, containing numerous seeds, each surrounded by a small quantity of fleshy pulp.

Saman: *Pithecolobium Saman*: A quick-growing expansive tree native of the East bearing pods which have the following composition:—

Moisture	63.0
Protein	3.3
Fat	.4
Starch, Sugar, etc.	30.9
Fibre	1.5
Ash	.9
N.R.	9.7
F.R.	75.2
F.U.	40.
R.C.	144

Sapodilla: *Achras Sapota*: A tree, cultivated in many parts of the Tropics, bearing fruits of a brown colour which vary in size with different varieties. The fruits possess a delicate flavour and rank among the best in the Tropics.

Sea Grape: see Grape.

Seville Orange: see Orange.

Shaddock: *Citrus decumana*: A tree belonging to the lemon, "Forbidden Fruit," and Citron class, bearing large fruits with a thick rind. The pulp, of sub-acid flavour, is eaten. The rind is used in making a preserve.

Sidium: *Flacourtia Ramonthii*: A tree producing large quantities of fruit of the size of a large cherry, of a purplish black colour with firm flesh, eaten when ripe

or used in making a preserve, Grown in the colony in fair quantity.

Simitoo : *Passiflora laurifolia* ; A creeper with variegated flowers bearing rounded yellow fruits whose pulp possesses a pleasant flavour.

Soursop : *Anona muricata* : A small tree, resembling the Custard Apple, bearing large fruits whose pulp possesses a pleasant sub-acid flavour.

Sorrel : *Hibiscus Sabdariffa* : A coarse herb resembling the Okra. The fleshy persistent calyx of the fruit, after fermentation with water, yields a beverage.

Star Apple : *Chrysophyllum Cainito* : A medium-sized tree with ornamental foliage, native of America, bearing rounded green or deep purple fruits from 2 to 4 inches in diameter. The pulp of the fruit is edible.

Sugar Apple : *Anona squamosa* : A tree resembling the Custard Apple and Soursop, bearing green or yellowish green rounded fruits about three inches in diameter, containing a whitish pulp of delicate flavour.

Surinam Cherry : *Eugenia Michelii* : A small tree bearing rounded fruits the size of a large cherry, marked with vertical furrows : of good flavour when ripe.

Suwari Nut : *Caryocar tomentosum* : A large forest tree bearing large fruits each of which contains two, three or four seeds, whose kernels rank among the best of edible nuts. The composition of the kernels is similar to the Brazil Nut. We have, however, found Suwari Nuts on analysis to be more oleaginous than the Brazil Nut.

Tamarind : *Tamarindus indica* : A tree of medium to large size, said to be native of Tropical Asia and Africa, bearing a pod with acid pulp which makes an excellent preserve and yields a syrup from which a pleasant cooling beverage is made. Grown in towns and villages.

Tangarine: see Orange.

Tonka Bean; *Dipteryx odorata*: A large tree, native of the colony which yields the fragrant seed known as Tonka or Tonquin, used for scenting snuff. An extract is obtained from the seed, which is employed in perfumery. The pulverised seed is used in making sachets, and is also employed in flavouring appetisers or "bitters." The plant grows readily from seed. A tree will yield about 20 to 30 gallons of seeds. The odour of the seed resembles that of new-mown hay, and is due to the presence of coumarine.

Tooroo; *Oenocarpus Batawa*: A tall native palm, bearing bunches of small chocolate-coloured fruits. The fleshy outer portion of the fruit is used in making a beverage resembling chocolate.

Vanilla: *Vanilla planifolia*; A climbing orchid bearing thin pods which are extensively used for flavouring purposes. This and other species are native of the forests of the colony. The pods are used by the native Indians, but there is no recognised industry in the colony.

The following table prepared by us in conjunction with Mr. R. Ward for the Government in August, 1914 shows the principal kinds of vegetable food-stuffs which are locally grown, the time usually taken from sowing or planting to reaping, and the average crops which they may be expected to yield per acre under the conditions prevalent on the front lands of the colony. The yields given in the table are for crops grown *per se*; when they are raised in mixed cultivation their yields will be almost proportionate to the area each kind occupies, although in some cases the yields per actual area occupied may be somewhat greater in mixed cultivation than where crops are grown separately. On the other hand it is certain that the yields of many others will be more than proportionately reduced.

	Months.		Yields per Acre.
Sweet Potatos ...	4— 5	...	2 to 4 tons
Cassava (sweet)...	6— 8	...	4 to 8 tons
Arrowroot ...	9—11	...	7 to 14 cwt. starch
Indian Corn or Maize	4	...	16 to 25 bushels
Guinea Corn ...	3— 5	...	20 to 50 bushels
Yams ...	9—11	...	1½ to 3 tons
Tannias ...	9—12	...	½ to 2 tons
Eddoes Chinese...	5— 6	...	1½ to 2 tons
Ground Nuts ...	4— 5	...	½ to ¾ ton
Various beans ...	3— 6	...	Not known
Pea trees ...	11—12	...	3 to 4 cwt.
Papaws ...	10 —12	...	50 lbs. per tree
Pumpkins, etc....	6	...	2 cwt. per vine may be obtained under favourable conditions.

In 1903 after the occurrence of a severe hurricane in Jamaica the Hon. H. H. Cousins, M.A., F.C.S., Director of Agriculture in that colony, compiled the following very instructive table, showing the proportion of nitrogenous, flesh-forming or proteid content in lbs. per ton of important varieties of foodstuffs, the fuel value in British Units, together with statements of average labourers' requirements of each sort of food in pounds per diem, firstly to conserve his bodily condition by meeting its nitrogenous requirements, and secondly to meet its requirements in fats and carbohydrates when engaged in heavy labour. The well balanced nature of such tropical foodstuffs, as sweet potatos, rice and corn meal, where the quantities required for conserving the bodily condition and for meeting working requirements are approximately similar, is very clearly indicated ; whilst the lack of balance in dried banana, breadfruit, mango pulp, coconuts, and molasses, each of which supplies an excess of carbohydrates, and in beans, peas, salt fish, and fresh fish, where the proteid content is very high in relation to the fats and carbohydrates, is noticeable. The advisability of using relatively small proportions of these foods containing a high proportion of protein in conjunction with larger quantities of those rich in fats and carbohydrates, is clearly indicated by the figures given by Mr. Cousins.

	Flesh Formers: lbs. per ton.	*Fuel Value: units per lb.*	*Labourers' Food Requirements; lbs. per diem.*	
			To conserve bodily condition.	*To meet working requirements.*
Sweet Potato	42	440	9	$7\frac{3}{4}$
Irish Potato	36	295	10	$12\frac{1}{2}$
Dried Banana	32	1,456	12	$2\frac{1}{3}$
Bread Fruit	47	823	8	4
Mango Pulp No. 11	8	318	47	$10\frac{3}{4}$
Coconut	58	2,500	$6\frac{1}{3}$	$1\frac{1}{3}$
Bakers' Bread	180	1,300	2	$2\frac{3}{8}$
Rice	160	1,620	$2\frac{1}{3}$	2
Cornmeal	184	1,645	2	2
Beans (shelled)	142	540	$2\frac{1}{2}$	$6\frac{1}{4}$
Peas (dried)	428	1,505	14 ozs.	$2\frac{1}{4}$
Salt Fish	320	325	$1\frac{1}{4}$	$10\frac{1}{2}$
Fish, fresh	200	370	$1\frac{7}{8}$	$9\frac{1}{4}$
Pork, fresh	260	1,300	$1\frac{1}{8}$	$2\frac{3}{8}$
Molasses	nil	1,225	useless	$2\frac{3}{4}$
Cow's Milk	66	310	$\frac{1}{2}$ gal	1 gal.

While we have been dealing in the above with foodstuffs from the aspect of their compositions, the importance of vitamines cannot be overlooked. These bodies are present in such foodstuffs as brown rice, maize, guinea corn, wheat, sweet potatoes, bananas and other fresh fruits, butter and milk. Hot-air-dried foodstuffs such as cassava and banana meals and flours as well as white and polished rice are deficient in vitamines; the almost complete absence of vitamines from purely starchy foods, and from both animal and vegetable fats when separated in a state of purity from the other constituents of the products in which they are contained or, as in the case of ghee, when prepared at unduly high temperatures, is of importance. At the present it is not feasible to determine the relative proportions of these bodies by chemical analysis; but consideration must be given to their presence or absence in the drawing-up of any scheme for nutrition in tropical as well as in temperate climates.

THE PREPARTION AND COOKING OF LOCALLY GROWN VEGETABLE FOODSTUFFS.

Mrs. J. F. Waby.

There is a very old saying which tells us that "It takes a very good cook to boil a potato, as though easy to boil it's easy to spoil." The same may be said of all vegetables; they are not difficult to cook, but they are very easily spoiled. If not perhaps actually spoiled, they are not what they ought to be either in appearance, taste or adaptability. In all books on Domestic Economy, Cookery, etc., great emphasis is laid on the need of great care in cooking and serving vegetables.

British Guiana has been described by an old resident as "a land of sodden vegetables," and not without reason; yet the blame does not lie with the vegetables, but with the lack of care and attention given to their preparation and cooking. Sometimes perhaps, it is due to lack of knowledge, particularly in the case of new-comers to the colony. The announcement of 'No potatoes to-day" so often seen in war time in shops overseas should cause no alarm in British Guiana; we have so many good and nourishing substitutes. Few people who have eaten yams properly cooked carefully crushed and seasoned, or have enjoyed cassava boiled, roasted or fried, would regret potatoes as they often appear on our tables. Old bush travellers have often said that a roasted plantain or a bit of roasted cassava is far better with morning tea or coffee than bread or crackers.

RULES TO BE OBSERVED.

The most important rules to be observed in cooking vegetables are: they must be put into *boiling* salted water and kept at boiling point; takon up as soon as done, and *all* the water drained from them. If they are to be kept hot, a clean cloth should be folded over them to absorb the steam; if left in the water even a

few minutes after they are done they will become sodden and tasteless. The only exceptions to the rule of boiling water are dried vegetables.

GREEN VEGETABLES.

In this as in all Tropical lands, green vegetables soon lose their crispness and freshness. They should—if possible as soon as gathered or purchased—be covered with a cloth wrung out of clean cold water. In the case of vegetables with roots or stalks—such as cabbage, lettuce and the various kinds of calalu—the roots or stalks should be put in water and the leaves covered with a wet cloth: green shalots, parsley and other seasonings keep fresh a long time if kept in a damp cloth and put in as cool a place as possible.

SPECIFIC INSTRUCTIONS.

French beans and green vegetables of all kinds, if limp and flabby, should be laid in a bowl of salted water for half-an-hour before cutting. Of all local green vegetables the various kinds of calalu may be considered the best—"Indian Kale" being quite as good as spinach if cooked in the same way.

Indian Kale.—Strip the leaves from the stalks: if the mid-rib of the leaf is tough, cut it out, wash in one or two waters to remove dust, etc., put into a saucepan with as little water as possible (just enough to prevent burning,) press down the leaves that all may be cooked alike; and when tender strain and press through a colander. Chop fine, add a little butter and pepper and return to pot to heat again, stirring carefully. Eddoe leaves—*i.e.*, "Water Calalu"—"Climbing Calalu" and "Caterpillar Calalu" may all be cooked in the same way: if served with gravy, the butter may be omitted.

Ochroes—The young pods should be topped and tailed, put into boiling salted water, drained as soon as tender, and a little lime juice and black pepper put over them.

French Beans—locally called "Sinabones"—should be topped, tailed and the strings cut away thinly, or

Boiling Yams:—Peel and wash a yam, put it into boiling salted water, boil till tender, take it out as soon as it is done, crush it lightly, or serve cut in slices if large; if small, whole. Yams vary so much that a definite time cannot be given but, 30 to 40 minutes is the average, unless they are very small.

Roasted yams are excellent. Mrs. J. R. Bovell, of Barbados, gives the following direction for roasting yams: "Lay a yam before the grates of the stove or in the oven, turning it occasionally till cooked scrape off the outer skin, cut into pieces or mash with butter and serve hot"

Boiled yam cut into chips and fried is very good. Cold yam may be used in making bakes, fritters, etc (see "Puddings.")

Boiled "Buck" yam mashed with milk and a little salt, or with a little butter is good food for young children.

Sweet Potatos:—Mrs. J. R. Bovell says "Sweet Potatos should be boiled in their jacke ts.' When cooked, peel and cut into slices before serving. Cold sweet potatos "may be cut and fried like cold yam."

Roasted Sweet Potatos—"Same as for yams."

Broiled Sweet Potatos—"Potatos to be half boiled, the skin removed, put into the oven or before the fire till they are nice brown colour."

Sweet Cassava is good either roasted or boiled. To roast, lay a stick of cassava in the ashpan, turning it occasionally. When done, scrape off the outer skin, burst it a little to let the steam escape and roll in a clean cloth to keep hot.

Boiled Cassava. Peel the cassava, cut into pieces 4 or 5 inches long; if very thick, split them. Put into boiling salted water. boil till tender (from 10 to 20 minutes, according to size) take up at once, let steam evaporate or it will be sticky and sodden instead of being dry and floury.

Cold cassava sprinkled with salt and pepper and fried is very good.

Any cassava put away for using in bakes, pie-crust puddings, should be flaked free of lumps with a fork while hot: it then keeps drier and is more easily worked up.

Eddoes and Tannias are more generally used for thickening soups, but they are good boiled in salted water, mashed while hot, and sprinked with black pepper.

White Tannia mashed free from lumps and mixed with milk or butter is very good for children.

Plantains have been called "the staple food" of the colony, so general is their use.

Green plantains are usually boiled with salt fish: a slice of pork and one of salt beef is sometimes added, or the pork is melted and the fat used with the plantains.

To make "Foo-Foo or pounded plantain they are boiled alone without salt. When done they must be taken out of the water and left to cool. They must be pounded in a wooden mortar with a "foo-foo stick": it is necessary to dip the pestle in water occasionally to prevent sticking. The paste must be smooth and rather soft. With a spoon dipped in cold water remove the "foo-foo" from the morter, flatten to shape and serve with soup.

Yellow plantains, *i.e.*, ripe but not soft, are boiled and served as an ordinary vegetable. Taking off the ends and boiling them in their skins, keeps them a better colour. The skins slip off easily.

Fully ripe plantains are cut into slices and fried.

Green plantains, cut into thin slices and dried in the sun, are ground and yield plantains flour, or conquintay flour.

Green Corn. The pods for boiling must be only just full, and not at all hard. Strip the husks off, leaving the inner one which draw down so that the silk may be removed, then tie the inner husks round the cob, put the prepared cobs in boiling water with plenty of salt, boil till tender, take up and drain, put a little butter on and serve hot.

Or the corn may be removed from the cob with a sharp knife and boiled: when finished it may be served,

with only a little black pepper, but is better with a sauce or with butter. The cobs for roasting should be stripped. If the fire is strong they may be roasted in the ashpit, but a clear coal fire is best, turning them that they may be done all round.

Breadfruit is a valuable food product, but in itself is rather insipid. If boiled in soup, stew, or with other vegetables it must be peeled and the core removed. It takes very little time to become soft. When boiled as a plain, table vegetable bread-fruit should not be peeled, but cut into quarters and put into boiling, well-salted water, 15 or 20 minutes, according to size, taken up at once laid on the "peel" side till the steam has gone then peeled, the core removed, cut into slices or mashed with black pepper. Boiled in this way and put away till cold, then peeled, cored and cut into rather thick slices sprinkled with pepper and fried in "crisco," lard or dripping, is the most tasty way of using breadfruit.

Breadfruit intended for cakes, etc., should not be crushed until wanted for use.

VEGETABLE SOUP.

Although our local vegetables are at their best when cooked in soups—that is, none of the good in them is washed—they do require the addition of fat in some form; strictly "vegetarian," they must be enriched with milk or butter. For ordinary use it is better to use a little salt or fresh meat.

The most suitable vegetables for soups are Tannias, Eddoes, Cassava, Pumpkins, Peas, Beans, Ochroes, and Calalu. Each and all are good, but they may be improved and seasoned with green "seasoning," a bunch of which contains a bit of green celery leaf, a spray of marjoram, a leaf of coarse thyme and a few green 'shalots or onion, garlic, tomatoes, (red pepper if liked), and black pepper and salt. To make them really nutritious, a little beef essence or good meat stock is necessary. But in any time of stress, especially in "war time," we cannot always get what we like, and must perforce like what we can get. The economical value of soup as

an article of food is that meat rejected from joints, chops, etc., locally called "soup meat," is cheaper. Bones, (fresh or already cooked), scraps of cooked meat salt or fresh fish (free from bones) may all be used as a basis. Bones that have been roasted or fried in cooking, give soup a good colour and flavour.

Whether the meat available be much or little, if it is to be eaten with the soup it should be cut into pieces, put into cold water without salt, brought slowly to boiling point, all scum removed as it rises and boiled till tender, when vegetables and seasoning should be added. When the vegetables are done, they should be taken out, mashed and returned to the soup with salt and black pepper to taste.

When meat and vegetables are to be used separately, the meat must be put into nearly boiling water without salt, brought to boiling point and allowed to boil 2 or 3 minutes till the scum rises. When this is removed the meat must be cooked slowly till tender, when salt may be added. Only sufficient time must be given to the vegetables to cook them without mashing. Onions or any seasoning to remain in the soup should be cut small. A few pieces of green papaw boiled with the meat, help to make it tender, and with pieces of boiled pumpkin, make a nice garnishing for the meat.

When all are done, the meat and vegetables should be taken out and the soup thickened with plantain or cassava flour—1 tablesponful to each pint of soup is a good average. The flour must be mixed smoothly with cold water, poured slowly into the boiling soup and boiled for a few minutes, stirred to prevent burning and salt and black pepper added to taste. Cornmeal may be used for thickening but is better made into dumplings, boiled separately and dropped into the soup.

Soup made from beans or peas is very nutritious; for weak digestion the peas should be pulped from their skin and returned to the soup, but for general use this is not necessary. If dried peas or beans are used for soup, they must be well soaked in cold water, put into fresh cold water, brought slowly to the boil, and boiled till tender.

All calalus contain a great deal of water, and it is advisable to boil them separately, or allow for the water in them. Ochroes should be sliced. Old time folks say, "soup with ochroes and calalu in should never be stirred with an iron spoon."

For those who like them a few shrimps, picked and scalded, improve most soups.

White tannias boiled in as little water as possible, mashed in the same water, milk added to make it creamy, with a very little pepper and salt and a small bit of butter (margarine is not good in this)is a delicate and nutritious soup for young children.

CURRIES.

Curries, if carefully made and served with a wall or border of well boiled rice, are appetizing and economical dishes, as they adapt themselves to any standard of cooking. They may be simple, or elaborate as circumstances permit.

Cold meat of any kind, fish, some vegetables, such as boulangers, cucumbers, and the smaller kinds of squash, make excellent curries. Eggs, boiled hard and cut into slices or quarters, as a dish by themselves or to help out a scarcity of meat, shrimps scalded and picked, salt fish cleaned and boiled, are all good.

Fish should be freed from skin and bone, which may be well boiled, the water strained and used instead of plain water for fish curries, as it is very gelatinous.

Any stock that can be made from meat bones or scraps is much better than plain water and, of course, makes the curry richer.

To make a good Curry:—

Slice 2 or 3 onions, fry them to a good brown, taking care that they do not burn, cut meat or fowl available, fry it with the onions, put all into a stewpan with a clove of garlic, and 1 tablespoonful of curry powder, cover it with water and let it stew gently till tender, mix a full teaspoonful of cassava, rice, sweet potato, or plantain flour (either will answer) with a little milk, a bit of butter, and some salt into a smooth paste and stir gently into the lot and let all boil together.

A little lime juice is an improvement, but it must not be *boiled*— put it in when all is finished

A simple way of making curry sauce for anything already cooked is to brown the onions, adding water (or stock) as required, mix 1 tablespoonful of curry powder, a teaspoonful of thickening flour, salt, a little butter, gravy or water, put into the pan with the browned onions and stir well till smooth, add cold meat, etc., and let all cook very slowly till heated through.

"PEPPER POT *i.e.*," "BUCK POT."

A "Buck pot" with cover is used for this old time dish—which like curries, may be made with the best of everything, or when "needs must" with simpler ingredients.

The basis of "Pepper Pot" is usually fresh fat pork, but it is less rich and much more nutritious when made with cow-heel, shin of beef, or pig's head and trotters. The meat must be cut up and boiled with a slice of uncooked salt-beef. When half done add 3 or 4 tablespoons of good, thick cassareep, 1 dessert spoonful of brown sugar, a few peppers, and salt to taste. It must boil till the meat is quite tender. Pepper-pot must be warmed every day to prevent it turning sour. When adding fresh meat, either cook it till tender separately or remove the already cooked meat until the fresh meat is well done, put back the removed meat and boil again. Cold meat may be added before boiling.

Irish Stew is a very economical dish in which a very little meat, fresh or cooked, will go a long way. If made of fresh meat, "soup meat" is excellent; the meat must be put into cold water without salt, brought to boil, any scum removed, and slowly stewed till nearly done, when the vegetables and seasoning may be put in, with pepper and salt, and all cooked together. If it is necessary to add more water, it should be hot. Cassava, yam, or sweet potatoes are all good in "Irish Stew."

If Irish Stew be made from cold meat, the vegetables should be boiled in only sufficient water to make

the stew thick and good—not watery. The seasoning must boil with them and the meat be added when the vegetables are nearly done. Pepper and salt to taste. Keep *stewing—not* boiling—or the meat will harden.

MEAT PIE.

Yam, cassava, sweet potatoes, eddoes or tannias, may be used for the "crust" of this pie. The boiled and crushed vegetable must be mixed with a little margarine or dripping; pepper and salt; a deep pie dish should be lined thickly with it, and the meat stewed with onions or shalots and a bit of fat pork (a goodly supply of gravy being made with it). A layer of meat is put in, then another of vegetables, more meat and all the gravy; and a thick cover of vegetable added and a bit or two of butter or dripping. Bake a light brown.

An excellent "crust" for meat pie may be made of boiled and crushed cassava and a little margarine or other fat and a few spoonfuls of cassava flour. Sift half a teaspoonful of baking powder and a little salt with the cassava flour, add to the cassava and knead all together till stiff enough to roll. If the cassava is dry a little water may be necessary, but must be sparingly used, or the paste will be sticky. Sprinkle flour on a board and roll the paste to the thickness desired. The pie dish may be lined with it, or if the meat is sufficient to fill the dish, only the cover need be made of the paste. Make a hole in the centre of the pie to let the steam escape. Bake a good brown.

Fish—free from bone and nicely seasoned—may be used for either of these pies.

RISSOLES, PLAIN AND SAVOURY.

Plain rissoles may be made from yam, sweet potato, or cassava.

Boil and mash the vegetable; add pepper and salt and parsley chopped (if liked); shape into rissoles; dip in beaten egg; roll in bread crumbs, and fry.

Rissoles are the most tasty, though not the most economical way of using scraps of cold meat or fish.

Mince or chop finely any cold meat or fish with seasoning, pepper and salt, mix with vegetables prepared as for plain rissoles, moisten with a little milk, or a beaten egg, roll in bread crumbs or cassava flour, ' and fry.

Meat or fish cakes are made in the same way, but shaped into cakes and plainly fried.

CEREALS.

Rice, well boiled, is the basis of very many savory and sweet dishes, besides being in itself one of the best of our locally grown foodstuffs. In cooking, care must be taken that it is throughly boiled, a point sometimes overlooked in the desire to have it "grainy." Nothing is more indigestible than half-cooked rice.

A very up-to-date cookery book gives the following recipe and calls it.

"*A perfect way of cooking rice*:—

"Put one cup of thoroughly washed rice into 5 cups of boiling water, cook from 15 to 20 minutes in a covered saucepan then set the saucepan *uncovered* in a warm place till all the water is evaporated. Rice should not be stirred, only shaken."

The most satisfactory way of cooking rice as a breakfast dish is as the well known "rice and peas." For this almost any kind of peas or beans may be used, green or dried; the dried variety must, of course, be well soaked previously.

To a pint of peas, allow a pint of well washed rice a pinch of soda if the peas are hard, and only water enough to cook the rice. When the peas are soft, add rice, an onion chopped, and a bit of salt pork and beef cut up. Salt fish may be used, or scalded and picked shrimps. Boil till all is well done and the rice rather dry.

Cold boiled rice may be used for puddings, rissoles, thickening soups, or in sweetened and flavoured milk as "rice milk."

Rice cooked with a young chicken and a small piece of fat pork, an onion or green shalots, makes a very dainty dish. Or an old fowl may be well stewed

with seasonings in plenty of gravy and rice enough t thicken the gravy used.

Rice Kedgeree is made by boiling and seasonin rice, adding fish already cooked, boned and skinned, o a tin of salmon, and pepper and salt to taste. A littl milk is necessary if dry fish be used, but the oil of th salmon is sufficient.

Rice flour is invaluable in nursery or sickroom as well as in making many dainty sweet dishes for table used in the proportion of half and half it mixes wel with wheat flour in pastry, etc. (see "Cakes.")

For blanc-mange and custards, rice-flour shoul supercede all imported "corn starch," "custard powder," etc. (see "Puddings.")

The "Indian corn meal" or maize flour shoulc be far more generally used than it is, being perhaps the most satisfying or all meals or flours, excepting oatmeal, for which it is an excellent substitute.

"The nutritive qualities of maize are considerable." As "stirabout" or "porridge" it is plainly boiled, in salted water, till thick, and eaten with milk, sugar, or molasses.

Cold boiled maize can be cut into slices and fried. It makes good cookies. (See "Cakes.")

The flour of guinea corn or millet is used in the same way: it is finer and less rough in taste.

Banana flour, locally called "Conquintay" flour, makes delicious gruel (*i.e.*, "pap") and pudding: and is excellent used for dumplings in soup or with stews.

Plantain flour is a good substitute for wheat flour, for thickening gravies and soups or for making thick sauces for haricot beans, or indeed any kind of beans.

STARCHES.

The best and most well-known of those is arrowroot.

Arrowroot is a pure starch, invaluable in the sick room, and for infants if blended with milk; or in convalescence with wine or meat essence. It is used for blanc-mange, custards, and buscuits. (See "Cakes.")

Cassava starch has many uses. Though not quite as delicate as arrow-root, it may be used in the same way. Mixed with equal proportions of wheat flour it is excellent in cakes, etc.

Sweeet potato flour is very good used for thickening soups, stews, gravies or sauces. It can also be used like rice flour in cakes, etc.

For making arrow-root, cassava starch, or "tous-les-mois" into nourishment for the sick, 1 tablespoonful should be mixed smoothly with part of a pint of milk (flavoured or not as desired); the rest of the milk boiled and poured slowly over the mixed starch, stirred and returned to the saucepan; boiled and stirred 5 or 6 minutes and sweetened to taste.

Banana and plaintain flour or starch can be prepared in the same way, but should be boiled quite 10 minutes after mixing

Breadfruit, sliced, dried and pounded makes a very fine flour, which may be used for custards, puddings, gruel or for thickening sauces.

PASTRY.

Meat pies have already been dealt with.

Pastry for an ordinary Meat Pie:—If equal parts of rice flour and wheat flour are used the pastry, though light, is not flaky. The addition of baking powder—1 teaspoonful to 1 lb. of mixed flour—makes it lighter, but it dries more quickly. A good short crust for either meat pies or fruit tarts may be made as follows:—Half a pound each of wheat and rice flour (or cassava flour), 1 salt-spoonful salt: sift together lightly; ½ lb. lard, "crisco," or "cottolene" (weight for weight crisco is best) rub the crisco into the flour with the fingers as lightly as possible, make a well in the centre and pour in nearly ½ pint of water; mix all together and roll out on a thinly floured board, fold over and roll again. If time allow, it is best to roll part of the crisco (or lard) in first. Rub the pastry and put away for half an hour; roll again and put on bits of crisco, sifting a little flour over. This may be done 3 or 4

times, the pastry being kept in a cool place in the intervals of rolling.

A good crust for Meat or Fish Pie—Take boiled cassava, finely mashed, wheat flour, a little lard or dripping and milk. Mix the flour and mashed together with a little salt, rub in the lard, mix with the milk, roll out and line the edges of the pie dish fill the dish with meat or fish, cover with the crust and bake.

PUDDINGS.

Rice Pudding: One cup boiled rice, 1 egg, ½ pint milk a bit of cinnamon or lime peel, sugar to taste. Put the flavouring into the milk to soak a little while before using. Beat egg and milk together, add sugar, pour over the rice and bake.

Cold boiled cassava, nicely flaked or crushed may be used in the same way: so may cold sweet potatos, but great care must be taken to avoid lumps.

Breadfruit pudding is delicious, but requires more flavouring for which grated nutmeg is best. It is crushed and used in the same way as cassava or sweet potatos. If desired, a few currants may be mixed in either pudding or a layer of jam or jelly may be put in.

Blanc-mange:– 1 large tablespoonful of rice or cassava flour (rice is the most delicate), ½ pint of milk, 1 flat tablespoonful of sugar, the thin peel of a lime or a bit of cinnamon. Soak the spice or peel a short time before boiling; mix the rice flour with a little of the milk while cold; boil the rest, and when boiling pour on the mixed flour, slowly stirring it well; put back in the saucepan and boil for 5 or 6 minutes, stirring it to prevent burning; add the sugar, take out the peel or spice and put into a mould or basin to cool. The same mixture with eggs and milk in proportion, poured into a pudding dish and baked, makes a delightful pudding. A little grated nutmeg and a bit or two of butter is an improvement, but not necessary.

Cold corn meal porridge is good if beaten with sugar, grated spice and milk, and eggs, if available; or

corn meal may be boiled with milk, spice and sugar. Both, if baked slowly, are good and satisfying puddings.

Sweet potato starch and guinea-corn meal make good puddings, or may be used to thicken custards either baked or boiled.

Custard: Take a pint of milk, 3 or 4 eggs, sugar, spice; boil the milk and pour on the eggs, after well beating them, mix one teaspoonful of rice, or other thickening with a little cold milk, stir slowly into the boiling custard, taking care that it does not curdle; if for baking, the oven must not be over hot and the custard must be taken out as soon as coloured.

BAKES.

Bakes are good, made of any of the local flours, and take less fat for frying then pancakes or fritters.

Bakes (cold boiled cassava):—4 table-spoonfuls mashed cassava; sugar and spice to taste, and a spoonful of milk for moistering. A dust of flour helps in shaping them. Fry in boiling dripping or other fat. These bakes are good, satisfying and economical, as they take little fat for frying; if given to children with morning tea instead of bread, or crackers, the results would be better. Of course, if eggs are available they are an improvement. Cold yams, sweet potatoes, or even eddoes can be used, but are not so light as cassava.

FRITTERS.

Light fritters may be made of mashed pumpkins, cassava, yam or bread-fruit: the mashed vegetable must be mixed into a batter with flour, eggs and milk. When well mixed, drop a small cupful at a time into boiling lard, fry them to a light brown on both sides, sift sugar over and serve with a cut lime. Fritters, though nice, are not cheap, as they absord so much fat.

"PONE."

"Pone" is made from raw cassava, sweet potatoes, or corn meal. "Cassava Pone."—Grate cassava (raw), add grated coconut, sugar, melted butter, melted lard, a little grated nutmeg, black pepper and powdered cinnamon, some currants (washed and picked), a small

red pepper (bruised); well grease a pan; pack the mixture in and bake.

Add grated pumpkins to "corn-meal pone": other ingredients, the same.

CAKES.

Rock Cakes or Buns may be made of equal parts of wheat and rice or cassava flour. For 24 cakes:—½ lb. wheat flour, ½ lb. rice flour, a small teaspoonful bicarbonate of soda, a pinch of salt, ¼ lb. crisco or margarine, ¼ lb. yellow sugar, a few currants of sultanas or a few drops of essence, 1 egg and nearly ½ pint milk. Sift flour, soda, and salt together, rub in crisco add sugar and currants, mix well, beat egg and milk together, put in essence (if used), stir all together and make into rock cakes; put on greased tins and bake in a moderate oven about 30 minutes. If the oven is too hot they rise too soon.

This mixture makes an excellent cake put into a tin and baked till done (one hour at least.) Carraway seeds are good in this, but are apt to burn on the top of buns.

Rice flour may be used with advantage in making sponge-cake, sponge rolls, and light tea cakes. Use wheat and rice flour in equal proportions.

"COOKIES" OR DERBY CAKES.

Half-a-pound of wheat flour, ½ lb. rice flour, 1 teaspoonful of baking powder, ¼ lb. yellow sugar, a *few* currants, ¼ lb. crisco or lard, and 1 egg. Sift flower and baking powder together, rub in crisco, then add sugar and currants, beat the egg—if small, a teaspoonful of milk or paste must be added, very sparingly, for if too moist the paste will not roll out. Mix all together thoroughly, roll out and cut into cakes, ¼ of an inch thick. Bake a very light brown (10 to 15 minutes should cook them nicely.)

Plantain Flour Cookies:—To ½ lb. plantain flour put half a teaspoonful baking powder, sift together, rub in two ozs. crisco, add 2 ozs. sugar, a little ground-ginger or grated nutmeg, add milk or a *small* egg till

the mixture is right for rolling: flour the board well, cut into cakes and bake a good brown. A morsel of candied peel, a split raisin, or a muscatel put in the centre improves their appearance only. About 15 minutes should cook them.

Corn-meal Cookies are excellent and keep well. Use the same proportions as for plantain Cookies, but they require slower and longer baking (20 to 25 minutes.)

SCONES.

Scones should be eaten hot if made with corn-meal alone, but if a little wheat flour be added they will be good and satisfying cold. Take half pound of corn-meal, ¼ lb. wheat flour, ½ teaspoonful bicarbonate of soda, a little salt, and sour milk to mix. Sift the flour, salt and soda together, mix with the sour milk, roll, shape and bake on hot plate or girdle. If wanted richer, margarine or lard may be added. Cold boiled cassava mashed free from lumps and mixed with a little baking powder, the yolk of an egg and a little salt, makes good scones.

COCONUTS.

The uses of grated coconut are numerous. In cake making and as a filling for open or closed tarts, in giving daintiness to curries, in flavouring and in the form of coconut cream or milk, it is very good.

Coconut Cream :— The nut should be grated. To each cupful of grated nut put one of boiling water, let it stand till cold and strain. This can be used in puddings in place of cow's milk.

Grated coconut mixed with yellow sugar, grated nutmeg or other spice and a few currants, is a good and cheap filling for patties. A little of the mixture added to cassava or other puddings add to their richness. It is also a nice addition to corn meal or other cookies. For confectionery it takes the form of sugar cakes, coconut drops, ice candy, etc., and is wholesome and nourishing.

BANANAS.

Bananas are a food in themselves without cooking, but they lend themselves to many very easily made and inexpensive sweet dishes.

As fritters they are simply sliced, dipped in any batter, dried and sugar sprinkled over them when done. If too ripe to slice they may be beaten up in batter.

Banana Compote:—Boil together one cupful of sugar, one cupful of water, a small piece of cinnamon bark, the grated peel of a lime and a teaspoonful of lime juice. When boiling, lay in as many pieces of banana as the pot will hold—the pieces can be cut an inch thick.

Baked Bananas:—Peel and cut off the ends of the bananas, split them, sprinkle with a teaspoonful of sugar and one teaspoonful of lime juice. Bake in a hot oven for 20 minutes.

For Banana Jam and Jelly (see "Jams.")

Bananas sliced thinly and sprinkled with sugar may be layered in boiled cassava or bread-fruit puddings.

JAMS, JELLIES AND PRESERVES.

The following directions for jam and jelly making were written when white sugar was cheaper; they may still be followed; but for war-time cookery yellow sugar, which is less than half the price, must be substituted.

It must be remembered that jam or jelly made with yellow sugar requires *quite 10 minutes longer boiling*, and all scum rising must be carefully taken off

All fruits used as stews, jams or preserves of any kind, should be boiled till tender with spice or other flavouring and carefully skimmed before the sugar is added. Less sugar is required and a better result obtained in this way than when, as is frequently done, all are put on together.

(Extract from "The Journal of the Board of Agriculture" January 1909 Vol. II. No. 3.)

For *Guava Jelly* the fruit must be cut and boiled for 20 to 30 minutes in sufficient water to cover it well, stirred with a wooden or enamelled spoon to loosen the seeds and prevent burning; than carefully strained through a course cloth or muslin; left a little while to settle, and then the clear water used in the porportion of 2½ pints to 2 lbs. of sugar.

Let the water boil, then add the sugar and a piece of alum about the size of a small cherry. From the time it starts boiling again it must boil as fast as possible for 20 minutes : the pan must be large, so that its contents will not require constant stirring to prevent boiling over ; as every time a cold spoon is put in it receives a check and so requires longer cooking. To make a clear, bright jelly very fast boiling is essential. Have a piece of cellular cloth or coarse muslin ready, strain the jelly immediately, put into bottles, fill full, and screw down at once.

Pine-apple Jam :—This requires great care as it burns very easily. The fruit must be chipped or grated, weighed, or measured boiled in its own juice or, when necessary a little water may be added. Then to every pound or pint allow one pound of granulated sugar and boil quickly, stirring constantly for 30 minutes or even a little longer if it is to be kept long or exported.

Carambola Jam : The fruit must be prepared by cutting off the acute edges, then cutting into pieces about ¾ inch thick ; boil 2½ lbs in 1½ pints of water till tender, which will take about 15 minutes; then add 2 lbs. of best granulated sugar and boil for 15 to 20 minutes. The seeds give a delicious noyeau flavour.

The same quantities of fruit, water and sugar, and the same time for boiling does for *Sorrel Jam*; this is improved by addition of a few cloves.

Sorrel Jelly. For this the fruit must be boiled to a pulp, strained, and 2 lbs. of sugar with a few cloves

added to every 2½ pints of juice. As in guava jelly, it must be strained when finished, and corked or screwed down immediately.

Orange Marmalade. For making this in the tropics, where the fruit is fresh aud the rind full of the essential oil, very few of the recipes given in cookery books answer.

The fruit should be cut in quarters, the flesh separated and soaked in sufficient water to cover it, the peel in *salt* and water. The peel must be boiled in two or three waters; the first with salt to extract the bitterness. As soon as the water boils it must be poured off. If the peel be boiled more than a minute or two with the salt no after boiling will make it tender. In the last water it must boil till soft enough to rub between finger and thumb. Then cut into thin slices, scraping away the white flesh. Next, well rub the figs of flesh to get all possible juice and gelatinous matter out, and strain; boil 2½ pints of this juice with 2½ lbs. of sugar. When nearly done—in 15 to 20 minutes—add 1½ lbs. of sliced peel, boil together very slowly for 5 or 6 minutes:—if boiled longer the peel will harden. Orange marmalade if properly made, bottled and covered while hot improves by keeping.

Green Mango Jam. Grate full green mangoes; to every 4 cupfuls of grated fruit put 2 cups of water, a bit of ginger: or cinnamon (ginger gives the best flavour); boiler till tender stirring frequently; when soft add 3 cups of yellow sugar, boil till it is quite thick, stirring constantly with a *long* enamel or wooden spoon, as it jumps and splashes badly when nearly done. Allow 10 to 15 minutes to boil the mangoes, 20 to 30 to boil the jam. Note:—*Never* use an iron spoon to stir fruit or jams, it blackens them and spoils the flavour. Mango jam is delicious when carefully made.

A nice way of cooking mangoes for desert or to eat with bread or pudding, is to cut the mangoes in strips; to every pound of mango put 1½ pints of water and a bit of ginger; boil slowly till tender, stirring carefully so as not to break the strips; when soft add ¾ lbs sugar

to each lb. of fruit, boil slowly again for 30 minutes When cold it should be pretty to look at, *i.e.*, strips of fruit in jelly—and dainty to eat.

Green Papaws may be used in the same way, but they require the addition of lime juice to give the necessary acidity. Green papaws make a fair substitute for apples, used in tarts or for sauce. For sauce, spice should be omitted.

Mammee Apples are used for jam and jelly—for jam, exactly like green mangoes. Care must be taken to avoid the white pith under the skin, which is very bitter.

Golden Apples are stringy and fibrous and should be boiled till they will pulp through a sieve. Allow 2 cups of pulped fruit to 1½ cups of sugar and use cinnamon or cloves for flavouring. They require constant stirring while boiling.

Cherries, *Gooseberries*, *Hog plums*, and *Governor plums*—(commoly called " Sidiums")—are best made into jellies, on account of the tense skin and seeds. Use the same proportions of strained water and sugar as for guava jelly.

Sorrel makes a bright crimson jelly and is a good substitute for red currant jelly which it resembles in appearance and taste. Pick the red calyx from the seeds and steep in water to cover, with a few cloves, for an hour or so; then boil in the same water till mashed; strain through muslin or crash, and allow 2½ pints of strained water to 2 lbs. yellow sugar.

A coarse jam is sometimes made from the red calyx, after being soaked for Sorrel drink

Sorrel Syrup. Boil and strain the red calyces, add to 2 pints of the strained water a few cloves, and 1 lb. of sugar ; boil till it is a thick syrup; bottle while hot. A tablespoonful swizzled in water makes a cooling and healthful drink.

Soursop makes a good opaque jelly. It should be peeled, boiled and strained, left to settle and the clear water used in the proportions of 2½ pints to 2 lbs. sugar.

Bananas, cut, boiled and pulped make a good jam for immediate use; they require the addition of spice and lime juice, and sugar to taste.

Banana Jelly, is also good for immediate use, but has no keeping qualities.

There are so many other fruits that are better for jams and jellies, that bananas are rarely used, more particularly as they have so many other uses.

CHUTNEY.

A simple, cheap and good way of making a most appetizing Chutney from green mangoes or green papaws is:—Grate mangoes or papaws and boil in enough water to keep from burning. When cold, measure, and to 2 cups of fruit, put 1 cup dark sugar, 1 cup brown vinegar, 1 or 2 blades of garlic, one or two onions chopped or pounded finely and red peppers to taste, (also pounded); boil over a slow fire till quite thick, stirring with a long spoon or stick, as it splashes like mango jam; put hot into screw-topped or tightly corked bottles and while hot, cover.

Chutney made carefully will keep for months.

There is never a month that some fruit is not available, for jam, jelly or stewed fruit. Many of these fruits are excellent substitutes for imported preserves. Many of them have a distinct flavour and adaptability to the need of residents in tropical climates; and in time should be largely used on account of their cheapness and freshness, and to avoid the large waste of good nourishing food so often seen and written about by those interested in the welfare of the people of the of the colony

WEIGHTS AND MEASURES.

Wheat Flour or Banana Flour.

4 level table-spoons full, weigh 1 oz.
1 cup full weighs $\frac{1}{4}$ lb.

Cassava Flour.

2 table-spoons full weigh 1 oz.
$1\frac{1}{2}$ cups full weigh $\frac{1}{4}$ lb.

Corn Meal.

3 level cups full weigh 1 lb.

Sugar.

1 heavy table-spoon full weighs 1 oz.
7 spoons full = 1 cup.
2 cups full weigh 1 lb.

Lipuid,

2 cups = 1 pint.
16 spoons full = $\frac{1}{2}$ pint.

Obituary.

BENJAMIN GAINFORT.

Born 11th Feby., 1861, Died 24th Jany., 1926.

It is with extreme regret that we have to record the death of Mr. Benjamin Gainfort, late Chief Commissary of this Colony, which occurred in England on the 24th January, 1926.

Mr. Gainfort was appointed an Assistant Commissary in 1893 and a first-grade District Commissary in the following year. He was appointed Chief Commissary in January, 1920, and retired on pension on November 1st, 1924. While a Commissary, he also acted as Superintendent of the Botanic Gardens from April, 1902, to October, 1904. Mr. Gainfort first became a member of the Board of Agriculture on the 8th July, 1902 whilst acting in the above capacity, and when he ceased to so act in October 1904, on the suggestion of the late Sir Alexander Ashmore, he was made a personal member of the Board with the object of securing his somewhat exceptional knowledge of drainage, irrigation, livestock especially horse kind, and tropical agricultural matters generally, as an assistance to the Board and to the Department of Agriculture. Mr. Gainfort's length of service on the Board was exceptional, viz., 22 years. He has been throughout his period of service a very regular attendant at the meetings of the Board and especially of those of such of its Committees he has been appointed to, and has been of great assistance to the Board of Agriculture in many ways.

At a meeting of the Board of Agriculture held on the 3rd February last year, at which the Governor presided, the Board unanimously decided to respectfully suggest to His Excellency that Mr. Gainfort who was an energetic member of the Board from 1902 to his retirement, should be made an Honorary Member of the Board. This proposal His Excellency was pleased to accede to.

Mr. Gainfort leaves a widow and two children, to whom we tender our sincere sympathy in their sad bereavement.—J. B. H.

EXPORTS OF AGRICULTURAL AND FOREST PRODUCTS.

Below will be found a list of the Agricultural and Forest Products of the Colony exported during 1925.

The corresponding figures for the two previous years and the average for the sixteen years prior to that are added for convenience of comparison.

Product.	*Average 1907-22.*	*1923.*	*1924.*	*1925.*
Sugar, tons ..	99,646	83,166	85,896	97,714
Rum, gallons ...	2,753,607	420,996	769,308	1,148,119
Molasses, gallons ...	122,547	65,997	1,160,757	1,345,243
Cattle-food (Molascuit) tons	4,509	814	1,102	1,268
Cacao, cwts. ...	367	None	None	None
Citrate of Lime, cwts.	164	None	None	None
Lime Juice, gals. ...	*10,181	11,019	9,785	8,430
Essential Oil of Limes, gals. ...	*390	218	396	306
Coconuts, thousands	1,630	2,650	1,560	1,363
Coconut Oil, gals. ...	*21,406	26,621	21,804	30,394
Copra, cwts. ...	1,163	8,401	16,508	17,278
Coffee, cwts. ...	2,716	4,778	4,581	5,964
Kola-nuts, cwts. ...	12	None	None	None
Rice, tons ...	6,728	3,971	4,470	6,918
Ricemeal, tons ...	764	None	None	None
Cattle, head ...	635	994	391	514
Hides, No. ...	4,986	5,916	8,902	9,801
Pigs, No. ...	715	455	427	889
Sheep, head ...	66	37	37	14
Balata, cwts. ...	10,682	9,164	12,234	8,079
Charcoal, bags ...	61,017	44,295	42,040	32,625
Firewood, Wallaba, etc., tons	8,121	7,674	6,477	6,143
Gums, lbs. ...	2,919	2,588	708	477
Lumber, cub ft ...	232,502	114,062	180,863	146,561
Railway sleepers, No.	9,159	8,916	39,238	39,779
Rubber, cwts. ...	70	12	35	96
Shingles, thousands	2,458	1,374	1,278	1,892
Timber, cub. ft. ...	181,420	152,168	168,454	216,749

* Average for seven years 1916 to 1922 only. No records available prior to 1916.

ATTENDANCES AT THE DISTRICT GARDENS

Year.	Bourda.	Belfield, E. Coast.	Stanleytown, New Amsterdam.	Suddie, Essequibo.	Den Amstel.	Houston, E. Bank.	Wakenaam.	Total Attendances.
1912 ...	5,514	4,395	3,302	2,100	2,544	2,156	1,718	21,729
1913 ...	5,156	4,535	2,519	3,399	2,568	1,836	1,319	21,332
1914 ...	4,243	3,869	2,443	3,025	1,791	1,653	1,533	18,577
1915 ...	1,123	1,006	769	59	503	339	401	4,209
1916 ...	4,705	1,161	1,510	225	623	2,251	1,297	12,026
1917 ...	4,991	2,820	1,366	3,297	1,186	2,564	1,663	17,086
1918 ...	4,834	3,081	1,653	2,671	2,162	2,790	2,067	19,258
1919 ...	4,769	2,425	1,582	2,798	1,851	2,480	1,556	17,461
1920 ...	6,285	2,312	1,665	2,525	2,532	3,228	2,148	20,695
1921 ...	5,671	1,968	1,642	2,629	1,949	2,539	1,610	18,008
1922 ...	3,557	1,841	1,105	1,593	1,525	1,522	1,397	12,950
1923 ...	4,038	2,780	1,595	1,934	1,953	2,137	1,951	16,388
1924 ...	4,123	2,827	1,103	1,789	1,678	2,146	1,664	15,330
1925:								
1st quarter	1,019	1,012	337	516	412	610	709	4,615
2nd ,,	624	582	350	478	...	417	361	2,812
3rd ,,	953	539	361	387	...	326	231	2,797
4th ,,	721	622	532	438	58	310	296	2,977

Meteorological Data 1925.

BOTANIC GARDENS, GEORGETOWN.

1925. MONTHS.	Rainfall.	Number of Days of Rain.						Evaporation
	Inches.	Under .10 in.	.10 to .50 in.	.50 to 1.00 in.	1.00 to 2.00 in.	Above 2.00 in.	Total Days.	Inches.
January	3.70	10	10	2	...	...	22	4.62
February	2.21	14	4	1	...	...	19	5.83
March	14.82	5	7	4	4	1	21	4.67
April	4.29	6	7	2	1	...	16	4.71
May	5.96	4	9	2	...	1	16	5.22
June	7.84	7	14	2	2	...	25	4.32
July	8.67	5	13	1	3	...	22	4.62
August	6.54	9	6	1	2	...	18	4.78
September	3.04	3	...	...	...	1	4	6.54
October	.87	3	3	...	...	...	6	5.99
November	.53	2	1	...	...	...	3	5.33
December	4.78	6	6	3	...	...	15	4.88
TOTALS.	63.25	74	80	18	12	3	187	61.51

Stations.	Wettest Day.	Rainfall. Inches	Hottest Day.	Temperature.
Botanic Gardens, Georgetown ...	15th March	6.00	30th Aug.	90.0
New Amsterdam Public Gardens...	28th May	2.60	5th Sept.	95.0
Onderneeming Essequibo ...	21st March	2.65	22nd and 25th Sept 24th Oct.	93.0
Morawhanna N.W.D. ...	26th March	1.59	...	...

AIR TEMPERATURE AND HUMIDITY IN THE SHADE, BOTANIC GARDENS, GEORGETOWN, 1925.

Months.	Air Temperature.			Humidity.
	Maximum.	Minimum.	Mean.	Mean.
January ...	82.6	73.5	78.0	79.5
February ...	83.4	74.3	78.8	78.0
March ...	83.6	74.1	78 8	80.2
April ...	85.1	75.6	80.3	78.8
May ...	85.5	75 4	80.4	77.9
June ...	85.2	74.9	80.0	81.6
July ...	86.2	75.7	80.9	79.9
August ...	86.2	75.3	80.7	81.1
September ...	87.2	75.8	81.5	77.8
October ...	87.9	75.8	81.8	75.8
November ...	87.5	75.9	81.7	76.1
December ...	86.3	75.2	80.7	76.3
Mean ...	35.6	75.1	80.3	78.6